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RAY BLAIN — *Technical Editor*

FRANCIS X. WELCH — *Washington Editor*

GLADYS HANSON — *News Editor*

MAYME WORKMAN — *Traffic Editor*

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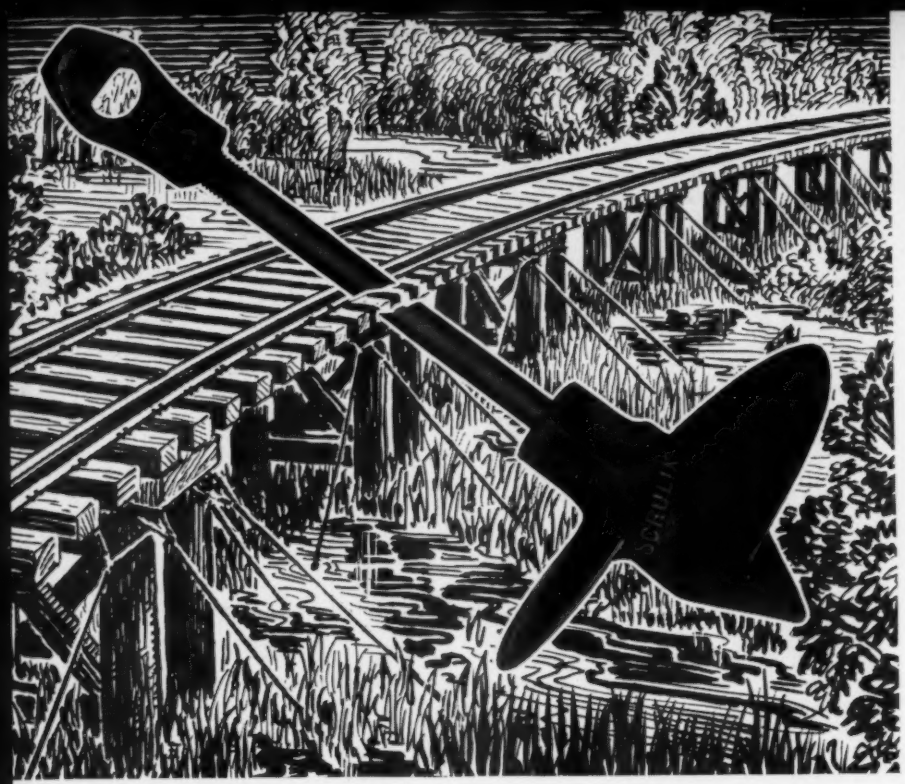

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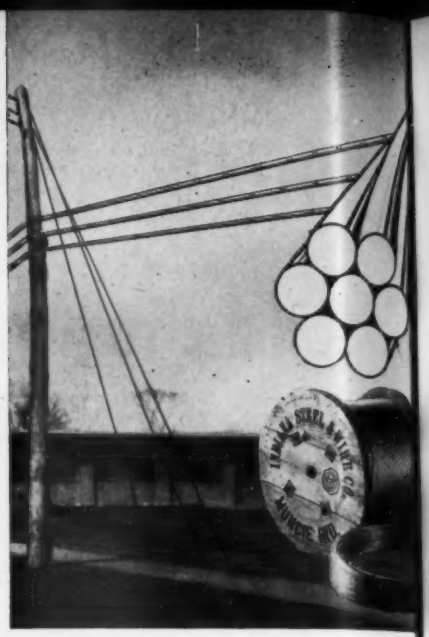

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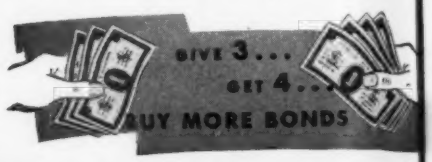

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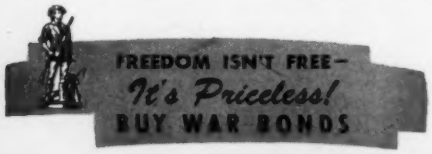

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LINE UP WITH *Kellogg* FOR LINE SUPPLIES

Better Take Some Chips

IN THIS GAME

If you want to gamble on losing some real money and position in your own telephone business, Mr. Welch advises you to stay away from such vital and important conventions as that of the United States Independent Telephone Association in Chicago.

By FRANCIS X. WELCH
TELEPHONY's Washington Editor

"CONVENTION" is one of the most interesting words in the English language. It is obviously derived from the Latin verb "*convenire*"—"to come together." But in our English tongue it has come to have two major and quite different meanings. First, a convention is an assembly, a congress, conclave, or any other synonym which means a lot of people getting together in one place to discuss, consider, or vote on matters of mutual interest. Secondly, it means a contract, custom or agreement which has the traditional respect, if not the approval and obedience, of a majority of people interested in the subject matter it covers.

In both interpretations of the word, does the telephone convention of today have a special significance for the American telephone business man or woman —particularly those engaged in small company operations?

There are a number of reasons—superficially mighty good reasons—why a small telephone man at this particular time might be tempted to cut his state and national convention: Manpower shortage back in the plant is scarce. Traveling is difficult. Hotel accommodations are hard to get. And in view of the pressure brought to bear by the government to conserve transportation facilities on less essential business meetings, a small company telephone man, busy as the proverbial one-armed paper hanger, might well ask himself "Why should I take several days' time out for a busman's holiday at my own expense to hear other telephone people talk about the telephone business? What's in it for me to offset these disadvantages?"

It is a fair question and your correspondent accepts it on just that basis and still hopes to show that you actually stand to lose some money, win some headaches, and generally put yourself behind the eight ball for the coming year, if not longer, if you haven't packed your bag and arranged to be present in Chicago, beginning October 10 for the United States Independent Telephone Association's annual meeting. For the same reasons money and headaches can be saved in a regional fashion by attending the state conventions from here on out.

It is probably a gratuitous effort on the part of this writer to discuss such a matter for the simple reason that most telephone men woke up to the importance of this issue long ago and do not need to be told. Best evidence of that is the fact that notwithstanding the streamlining of sessions, curtailment of programs, and elimination

HOTEL RESERVATIONS FOR USITA CONVENTION

It is understood that, due to the overcrowded hotel facilities at the time of the annual convention of the United States Independent Telephone Association, to be held October 10, 11 and 12, the Stevens Hotel, in which the convention will be held, will endeavor to make reservations in other hotels for those telephone men and women whom they are unable to accommodate during the convention.

It has been suggested that, in spite of the shortage of facilities at the Stevens, all those planning to attend the convention send their reservations to the Stevens Hotel, in care of W. F. Puffer, who, in turn, will endeavor to make their reservations at nearby hotels, and will inform them as to which hotel they have been assigned.

Send your reservation to Mr. Puffer immediately.

of entertainment features, war conferences of the Independent telephone industry have successively broken all attendance records, for both the national and state associations. But just in case there is a straggler here and there who, in his own self-interest, has failed to figure it out for himself, and also to fortify the good judgment of those who have figured it out, here are some reasons why you are well justified and well advised to take some chips in this game.

First of all, it may be objected that the war meetings have lacked the social zip of former convivial gatherings when the goose hung high and entertainment flowed freely. Aside from the fact that there is no lack, even today, of really profitable conviviality for those who are smart enough to combine business with pleasure, the very seriousness of present day meetings should emphasize rather than detract from their importance.

In former years, entertainment features were rightly spotlighted and we can all look forward to the time when it will happen again. We need not feel ashamed of a slight feeling of nostalgia for the days when cynical, if not indignant women-folk, were inclined to wonder whether the "road to Hell is paved with good conventions." Those were the times when some people thought a "delegate-at-large" was a fellow who came to the convention without his wife.

It is still true, even of these war meetings, that some of the most fruitful results can be obtained by man-to-man conferences and straight-from-the-shoulder "talking shop" in hotel rooms after the formal sessions are concluded. All of us know of instances where lasting friendships have been established, maintained and periodically renewed, where industrial problems have been aided if not solved, where misunderstandings have been removed under the auspices of the old Latin slogan, *In vino veritas.*

But the businessman going to a convention today has special problems, which are so serious that he probably would not take any heart in highjinks even if it were available. Like as not, he has a boy or girl in the service, if not in the combat areas. Certainly he must have many business associates who have answered the call to the colors while he is trying to keep things going on the home front so there will be jobs for them to come back to. Americans in any business line, with these things weighing on their minds, come to these meetings at this particular time for a truly essential purpose. They come because they feel that they will find the answer to problems, or at least help on problems, which they cannot solve for themselves as individuals.

STATE ASSOCIATIONS EXECUTIVES MEETING
Private Dining Room No. 1, 12 m., Tuesday, October 10

Let us dispose of one more negative argument before we move on to more positive things. That is the possibility that the small company telephone man might say: "These big meetings in Chicago and elsewhere are all very fine for big company fellows who can afford them, have plenty of time for them, and participate more actively in the committee work and other inner controls of the convention machinery."

If you are ever tempted to think along this line, Mr. Small Telephone Man, just consider this: *The larger telephone companies have, if anything, less need of enlightenment from these meetings than the small company representatives.* The large telephone companies have their own high-priced lawyers, economists, financial advisers. One large Independent telephone group even maintains its own separate office in Washington, while others have professional contacts there.

No, the big companies, if they *had* to get along without these meetings, could certainly do so much better and with much less chance of loss than the small company *whose only source of expert information, outside of his weekly news coverage and analysis provided for* TELEPHONY, *is in his national and trade associations affiliation.* Viewed in this light, these conventions are primarily made to order for the small operator and his business colleagues. A dollar spent by a small company man probably returns to him in terms of sound information, encouragement, enlightenment, and inspiration more than $10 or $100, relatively speaking, put out by the representative of a large telephone combination.

It is no accident that the United States Independent Telephone Association did not segregate small company problem discussions on its program for the simple reason that it was earnestly intended that small company representatives should attend all of the sessions and participate in all of the discussions. There is not a single topic on the program from which he cannot benefit. There is no session that he can neglect in order to concentrate on others.

ANNUAL MEETING
Independent Pioneer Telephone Association
West Ballroom
2 p.m., Tuesday, October 10

What about this program that USITA has arranged in Chicago October 10? The outstanding impression this writer gathers from the review of the topic headings and from a slightly more intimate knowledge of the actual menu to be served, is that it is a carefully *balanced* program. Often in the past, perhaps, convention programs have had a tendency to go to one of two extremes: (1) Too much concentration on a big-name speaker with the result that other sessions were neglected; (2) too much concentration on technical discussions so that there was no climax to hold the interest and attention of those in attendance, and send the men home with a lasting impression, skillfully inculcated by a climactic speaker.

In other words, such conventions had a tendency to resemble a good many prize fights and a good many marriages — the preliminaries proved more interesting than the main event.

Your correspondent will do no more than run over the various topics of the USITA program, which have already had considerable publicity, for the purpose of emphasizing their importance to the small company operator. First, there is the plant conference with its discussion on such puzzling but increasingly important matters as postwar radio-telephone operations, the older and better known problem of conversion from manual to dial operation, maintenance and protection hints. Second, there is the dramatized traffic conference. Third, the commercial conference which was scheduled to include a corking good discussion on the farm telephone. The importance of the remaining accounting conference should speak for itself in these days of gradual shift from the engineering type of regulation to the bookkeeping type of regulation.

Every telephone man naturally will want to hear the report of the association's officers the first day of the general sessions, culminating with the eagerly awaited address of Walter S. Gifford, president of the American Telephone & Telegraph Co. And what small telephone company operator will want to miss such provocative discussions as "Where do we go from here on wage-hour matters?" "Advice for small companies on the 40-cent minimum wage," and the new learner regulation.

Likewise, the concluding day is scheduled to feature a threshing over

(Please turn to page 81)

PROGRAM FOR 48th ANNUAL CONVENTION

UNITED STATES INDEPENDENT TELEPHONE ASSOCIATION

STEVENS HOTEL, CHICAGO

SERGEANTS-AT-ARMS

H. B. Couch **S. A. Lane** **J. G. Hardy**

TUESDAY, OCTOBER 10

9:00 A. M.—Registration, North Assembly Room, Third Floor.

10:00 A. M.—**DIVISION CONFERENCES:**

Plant Conference, North Ballroom.....*F. E. Norris, Chairman*

(a) LIGHTNING PROTECTION FOR TELEPHONE PLANT....by *E. W. Olschner*

(b) POSTWAR APPLICATION OF RADIO CHANNELS TO THE TELEPHONE INDUSTRY.....by *B. C. Burden*

(c) PROBLEMS INCIDENT TO CONVERSION FROM MANUAL TO DIAL OPERATION.....by *W. B. Clay*

(d) PRACTICABILITY, VALUE AND TECHNIQUE OF PREVENTIVE CABLE MAINTENANCE.....by *E. H. Danner*

Commercial Conference, Private Dining Room No. 2 .....*J. F. O'Connell, Chairman*

(a) UNATTENDED DIAL INSTALLATIONS.....by *H. F. McCulla*

(b) FARM TELEPHONE SITUATION.....by *Leland Wright*

(c) ADVERTISING.....by *L. F. Roberts*

(d) ADEQUATE RATES FOR SMALL TELEPHONE COMPANIES.by *R. F. Lucier*

2:00 P. M. **Traffic Conference,** North Ballroom.....*W. C. Darrow, Chairman*

(a) Dramatization of Traffic Troubles and a Solution.

Accounting Conference, Private Dining Room No. 2.....*C. D. D'Aoust, Chairman*

(a) TREATMENT OF INDIRECT COSTS AND OVERHEADS BY ACCOUNTS AND EXCHANGES.....by *R. D. Heusel*

(b) PAYROLL PRACTICES TO MEET PRESENT DAY CONDITIONS .....by *A. G. Kiesling*

(c) IMPORTANCE OF MAINTAINING ADEQUATE ACCOUNTING RECORDS .....by *R. H. Buckles*

WEDNESDAY, OCTOBER 11

9:00 A. M.—Registration, North Assembly Room, Third Floor.

10:00 A. M.—**GENERAL SESSION,** North Ballroom.

THE INDEPENDENT TELEPHONE INDUSTRY TODAY AND TOMORROW .....by *Charles F. Mason, President*

REPORT FROM THE ASSOCIATION'S HEADQUARTERS .....by *Clyde S. Bailey, Executive Vice President*

REPORT OF SECRETARY-TREASURER.....by *Charles C. Deering*

2:00 P. M.—**GENERAL SESSION.**

REPORT OF ADVERTISING COMMITTEE.....by *R. A. Phillips, Chairman*

ADDRESS...by *Walter S. Gifford, President, American Telephone & Telegraph Co.*

PANEL DISCUSSION ON EMPLOYMENT RELATIONS PROBLEMS:

(a) WAGE TRENDS AND THEIR EFFECT ON THE INDUSTRY

(b) WAYS AND MEANS FOR THE SMALL COMPANY TO MEET THE 40-CENT MINIMUM

(c) THE NEW LEARNER REGULATIONS

Chairman—John H. Agee, Vice President and General Manager, The Lincoln Telephone & Telegraph Co., Lincoln, Neb.

Member—W. B. Clay, Manager, Hutchinson Telephone Co., Hutchinson, Minn.

Member—F. M. Browne, Western Light & Telephone Co., Kansas City, Kans.

THURSDAY, OCTOBER 12

10:00 A. M.—**GENERAL SESSION.**

REPORT OF TOLL COMPENSATION AND SETTLEMENTS COMMITTEE.....by *E. M. Blakeslee, Chairman*

REPORT OF TELEGRAPH COMMITTEE.....by *C. D. Brorein, Chairman*

ELECTION OF DIRECTORS

REPORT OF POSTWAR PLANS AND WAR ACTIVITIES COMMITTEE .....by *E. C. Blomeyer, Chairman*

(a) DESCRIPTION OF PENSION AND RETIREMENT PLANS .....(*Speaker to be announced*)

(b) THE COMMITTEE'S WAR ACTIVITIES....by *R. A. Lumpkin, Vice Chairman*

2:00 P. M.—**GENERAL SESSION.**

SOME CONSIDERATIONS INVOLVING TELEPHONE DIRECTORIES .....by *Frank Davies*

PANEL DISCUSSION ON TAX PROBLEMS—

(a) THIS CURRENT WAVE OF RELATING RATES TO EXCESS PROFITS TAXES

(b) WHAT WE SHOULD SEEK—AND WHAT WE MAY EXPECT—IN POSTWAR TAXES

Chairman—H. V. Bozell.

Member—Carl I. Wheat, Washington, D. C.

SMALL EXCHANGE STRUGGLE FOR SURVIVAL

FOREWORD

THE STRUGGLE for survival presently facing a substantial portion of the nation's small telephone exchanges has enlisted thoughtful attention from all components of the industry. Since TELEPHONY beamed its editorial spotlight on this critical situation several months ago, it has become a discussion subject of first rank for association groups, executive and management personnel of larger operating companies, trade publications, manufacturers and, in many instances, for state regulatory bodies.

None will challenge that this focusing of attention on the plight of smaller companies has been an initial step of tremendous worth toward the objective of getting something done about it. The resultant awareness evidenced by the entire industry and by a number of state commissions of the magnitude and critical state of the prevailing situation has set the stage for cooperative efforts which are so necessary for working out and effecting solutions.

Equally apparent is the fact that the REAL burden of solving the so-called "small exchange problem" rests, of necessity, primarily on one group alone—those who own and operate the properties. Operators of the small exchanges, threatened with extinction unless their plants can be reconditioned and modernized to render a better grade of service, and unless their revenues can be increased sufficiently to enable them to continue in business, must be motivated to act in their own behalf.

The contention that small exchange operators must supply the energy and much of the resourcefulness needed to work out their own salvation does not deny the involvement of all segments of the industry in the situation. All have a sizable, if indirect, stake, and thus a definite responsibility. Statistics indicate that perhaps one-half of the area of the nation is within service territories of the small Independent exchanges under discussion. The more than a million and one-quarter telephone subscribers connected to these small exchanges constitute an integral section of the nation's overall communications system. The vital importance to the entire industry of getting these small exchanges into sound operating condition at the earliest possible date is self-evident. So is the fact that the job cannot be done, in most instances, unless experienced management guidance is provided by industry leaders and association groups.

Because procedures for rate applications and related projects involving telephone operations and financing vary rather widely between states, formulation and administration of assistance programs for small companies are probably logical functions of state associations. Several associations have already developed such programs and, within the limitations imposed by wartime handicaps, are producing constructive results. Still other associations have assigned committee groups to study the problem and its solution within their respective states.

The United States Independent Telephone Association, within the broader scope of its activities, is continuously making its contributions to all Independent companies, both large and small. In fact, if we were to eliminate only two of the many recent accomplishments of the national association—the Herring Amendment to the Fair Labor Standards Act and last year's toll compensation increase—the small exchange situation (if, indeed, any exchanges of that classification remained in existence) would likely be such that no amount of planning and effort could possibly remedy it.

The comments in this article and in those to follow are directed specifically to those individuals and small local groups who own and operate small exchanges in distress. We have no panacea to propose. It is obvious that there is none. An endeavor will be made to assist small operators, by discussion of possible ways and means, in planning and working out solutions to their problems. Our goal is modest. If our efforts accomplish no more positive results than to provoke thought and stimulate self-examination, a worthwhile purpose will surely be served. One set of facts must be faced with candor. It cannot be denied that, in many instances, the critical conditions now threatening the very life of small exchange properties found their roots in inertia, negligence and economically unsound practices.

On the other hand, the past 10 years have confronted the telephone industry with situations to confound even the most ably staffed and competently managed companies. Critical operating problems resulting from the sharp station and revenue losses of the depression years were followed in quick succession by those growing out of rural electrification, upward wage trends and related costs, tax collections and record keeping functions imposed by governmental regulation, and a score or so more. There is little room for wonder that small operators, many of them not too soundly organized or in healthy condition to begin with, have approached a point of despair.

Today's horizons appear somewhat brighter. The farmer, who is the backbone of most small telephone exchanges, wants service and is in a position to pay for it. The attitude of the regulatory bodies generally is sympathetic. Those who need financing today should find money easier to obtain than in many years. There are, too, many indications that the postwar period will offer new opportunities for constructive development in many fields of commercial endeavor, with particular emphasis on "small business." Surely no enterprise can more properly qualify as "small business" than a small town rural telephone exchange. If they are to be restored to sound physical and financial condition so as to be able to fulfill their function of utility to the hundreds of thousands of homes, farms and other small enterprises comprising those communities, the time is here—and in many respects, propitious—to get to work on definite plans for action.

By Norman M. Shenk

Peninsular Telephone Co.
Tampa, Fla.

YOU MEN and women to whom the following comments are addressed are the owners and operators of several thousand telephone properties located in small towns and rural communities in every section and in nearly every state in the nation. Many of your exchanges are in acute distress; some to an extent that they will be forced out of business before very long unless they are relieved. The problems besetting you, while differing in many respects according to your own local conditions, are basically similar. What can be done about your problems? Are there steps you small exchange owners can take to work out of the crisis you face? Is there a way we can help you?

It can be said to start with that there is no magic formula which can be universally applied to change run-down and insolvent properties into modern plants rendering quality service at a profit to their owners in Cinderella-like fashion. In fact, it must be recognized, as a preliminary to any general consideration of small exchange problems, that there are unquestionably several hundred communities in which exchanges are now located that are either not sufficiently populated or sufficiently productive to support a separate telephone system. The telephone communications needs of such communities can best be met by toll stations or by company or subscriber-owned exchange lines from a nearby larger town or city. We will turn our attention to further discussion of such arrangements later on.

While there is no cure-all for the ailments of small telephone exchanges, there is, however, a bulk of evidence to indicate that with earnest inclination, some careful planning and the application of tested business principles, individual programs can be developed which will enable the majority of your small properties to become sound "going businesses" — meeting fully their service obligations to subscribers and their financial obligations to employes and owners. The sole objective of these articles is to assist you, if possible, in the formulation and execution of such programs.

As a manner of approach to our undertaking, suppose that we consider ourselves somewhat as a discussion group. Unfortunately, the "discussions" will, of necessity, have to be mostly one way. However, such an approach is advantageous. It will allow an attitude of informality as well as considerable freedom to critically and frankly examine our common problems, expose and analyze our weaknesses and explore possible methods for overcoming both.

Because it is not possible for all of us to actually assemble for our discussions, our purposes can be served by using the columns of TELEPHONY as our medium. The author will direct his efforts—most humbly you are assured—to serve as your discussion leader. Incidentally, the author boasts of no particular qualifications for the assignment as coordinator of these discussions other than a very real interest in small exchange operations and an equally earnest conviction, as already expressed, that there are, at least in a substantial majority of cases, practical, workable solutions to the conditions

INTRODUCING THE AUTHOR

Mr. Shenk has been associated with the Independent operating telephone industry for 18 years, during which he has had experience in practically every department of telephone operations. Much of this time has been spent in directing the operators of small telephone exchanges, giving Mr. Shenk an excellent background of experience from which to write this series of articles, particularly directed to owners and managers of small telephone exchanges.

NORMAN M. SHENK

From 1926 to 1930, Mr. Shenk was employed by the Mutual Telephone Co., Erie, Pa., during the summers while attending college. His assignments included that of installer's helper, construction "grunt," field engineer and automatic switchman. He was graduated by the University of Pittsburgh in 1930.

Following graduation, he became associated with the Pennsylvania Telephone Corp. (successor to Mutual Telephone Co.). He remained with this company for five years, during which time he served as directory supervisor, manager of the Erie district and assistant general commercial superintendent of the Eastern operating group of the Associated Telephone Utilities System (now General Telephone Corp.).

In 1936, he was employed by the Jamestown (N.Y.) Telephone Corp. as commercial superintendent. This company and its associated companies, Meadville (Pa.) Telephone Co. and Home Telephone Co., Ridgeway, Pa., operate 25 exchanges in New York and Pennsylvania.

In 1937, Mr. Shenk entered the employ of Investors Telephone Co., with which he was associated for seven years. For two years he served in the dual capacity of system general commercial superintendent and general manager of the Iowa State Telephone Co. The Investors System has 112 exchanges, with 80 per cent having less than 500 stations. The Iowa State company operates 34 exchanges. For five years Mr. Shenk served as vice president and general manager of the Central Carolina Telephone Co., Southern Pines, N. C., which operates 28 exchanges of which 25 have less than 300 stations each.

Mr. Shenk became associated with the Peninsular Telephone Co., Tampa, Fla., which he is now serving in an executive capacity, in May of this year.

He has had extensive experience in association work, having served on the boards of directors of the North Carolina Independent Telephone Association, South Carolina Independent Telephone Association, and at one time he was secretary of the North Carolina association.

generally referred to as "small exchange problems."

In order to clearly define and limit the scope of our efforts, perhaps a logical starting point is to take a roll call and see just who comprises our group. The term "small exchange" is a general one and does not readily lend itself to exact description. For our purposes, the classification may well be considered to include exchanges up to as large as 600 subscribers, although the bulk of those in serious difficulty are undoubtedly in the bracket having less than 300 stations. In our group, then, are exchanges with service territories ranging from small unincorporated communities, and the rural territories contiguous to them, up to towns of 4,000 or 5,000 population and their trade areas.

The record books indicate that there are approximately 10,000 Independent telephone exchanges within that size range. Nearly a third of them, however, are units of larger operating companies which are receiving the careful attention of competent management. It would appear that some 1,200 others, mostly owned by small local groups or individuals like yourselves, have, by the employment of foresight and resourcefulness, worked out solutions to their own problems and are in reasonably sound condition. This leaves some 5,000 or 6,000 exchanges, mostly singly-owned or in groups of two or three by individuals, families and local groups or mutual associations. It is the owners and operators of these 5,000 or 6,000 to whom these comments are particularly directed.

Having broadly set forth our objectives and defined our "membership," let's use the space allotted to us for this initial "session" to take a good look at the problems confronting us. Just what are the conditions that have already forced some small operators to close their exchanges and abandon their plants and have others wondering if the wise move wouldn't be to follow suit? Have the larger operating companies faced the same problems with their small exchanges?

Your individual problems naturally vary in number and severity depending upon several factors peculiar to your own operations. A few of the more influential elements would include: (1) Extent and productivity of territory served; (2) type and general condition of your plant; (3) financial structure and status of your organization; (4) relative adequacy of your present rate schedule; (5) volume of your toll business and characteristics of your toll handling arrangements, and (6) attitude and procedure requirements of the regulatory commission having jurisdiction over your operations.

(Courtesy, PUBLIC UTILITIES FORTNIGHTLY)

"Tell Chief Wabungi he will just have to get along with his present supply of telephone equipment. There's a shortage of sets, you know."

However, to a greater or lesser extent, the conditions facing your operations, narrowed down to fundamentals and simply stated, are these:

(1) Your revenues have long been inadequate to allow you to properly operate and maintain your property and provide a reserve for replacing worn-out and obsolete plant.

(2) Your expenses for material, labor and other items have been increasing steadily for the past several years.

(3) As a result of both, in many cases, the service you are able to render is not of a quality to be worth even the rate you do charge for it.

There are two principal reasons for your inadequate revenues — too low rates and too few subscribers — and more often than not, both are contributory. In fact, they are obviously kindred. Moreover, most of the conditions threatening to destroy you will be found to be similarly related. And, almost without exception, they can be traced back to one basic fault—*insufficient income to properly operate your plant.*

The typical small exchange situation prevailing today developed along a course about like this. Some 20 or 25 years ago exchange rates of a sort were adopted. Rarely had these rates any basis other than happenstance. Frequently they were the same for business or residence usage and the same for individual line town service or for rural customers on the end of several miles of party line.

Had all expenses been taken into consideration, these rates often would have been too low when they were established. Yet they have remained unchanged throughout the years. In many instances, these rates—as low as $1.00 per month or less—are nothing short of ridiculous when viewed today.

During the past two decades the telephone industry as a whole has made its greatest advancements, both as to volume of customers served and quality of service rendered. During the same period, lack of funds to work with has forced many small exchange operators along a course in quite the opposite direction. Without adequate income, even ordinary maintenance has been impossible. Without a reserve for the purpose, worn-out plant has not been replaced. Poor service follows ineffective maintenance as surely as night follows day. Poor service, in turn, has brought dissatisfied customers and ultimately further reduction of revenues by service cancellations.

In an effort to stem the tide, expedients which have since proved impractical were attempted. In some in-

stances, the hours of service were curtailed and exchanges closed at nights and on holidays and Sundays—periods during which service may be of its greatest value to some customers. In many cases, inability to meet prevailing wage rates has caused the loss of valuable employes.

Those, it appears, are the problems generally common to our properties. However, we must go still further in our analysis if we are to have full facts on which to shape our programs, if we expect the programs we develop to attract support. Frankly, some forthright self-examination is in order in many instances, even though it may be a trifle hard to take.

The facts are that many of the conditions working to put small owners and operators out of business have resulted from their own actions or, as has more frequently been the case, from their own failure to act to surmount them before the damage was done.

The majority of you who are suffering from ailments, which are largely an outgrowth of inadequate revenues, have done little or nothing to correct the fundamental fault. Either hesitancy to approach the state commission for fear of costly involvements and red tape or because of unfamiliarity with commission procedure or unwillingness to offend your friends or neighbors by seeking rates to which you are entitled (and which are necessary to render them the service to which they are entitled) has caused you, instead, to stand by while your plants have fallen down and your service approached uselessness.

Some of you, thus faced with an unprofitable operation, have let your telephone exchanges become a sideline while you have turned your efforts to some other field, hoping that the remaining subscribers would continue to pay in enough income to allow the exchange to get by "until something happened."

Few of you have kept even basic plant accounting records and some not even revenue and expense books. Another weakness has been haphazard collection practices, the inevitable result of which has been disproportionate losses and difficult "sore spots" to stand in the way of recovery efforts.

Now those may seem like pretty strong words. But they are facts and all of us know it. On the whole, our management is not a very good one. Certainly not all of the conditions outlined apply to all of your situations. Neither are all of you guilty of neglecting or wittingly abusing your telephone business. But a composite of the conditions existing at the small telephone exchanges represented by this group would pretty well fit the pattern set out. Surely our approach to a way "out" is a realistic view of the state we are "in." There are steps we can take to secure fair and adequate rates, to rehabilitate plants so that good service can be rendered and to attract new customers to further improve revenues. The proof is in the record.

But such programs cannot be permanently successful unless they are undertaken and administered by prudent management under proved and sound business standards. You who own and operate the properties must provide that management.

As we seek in this series of discussions to develop tangible plans for attacking our situations, we will do well to turn our attention to the manner in which the larger companies have met the problems of small exchange operation. Many hundreds of rural towns and communities, no larger and frequently smaller than those in which your exchanges are located, are served by exchanges of nearly every major telephone company — Independent and Bell.

And, contrary to the opinion that some of us hold, an overwhelming majority of the small exchanges operated by the larger companies are standing squarely on their own feet. In fact, they have to, for while few of us stop to realize it, about 40 per cent of all "Class A" Independent operating companies (those grossing $100,000 or more a year) are comprised of exchanges which average less than 500 subscribers each. There are at least 15 such companies which are made up of exchanges averaging less than 250 subscribers per exchange. Several of the latter group have no exchange with as many as 1,000 subscribers.

There can be no doubt but that these companies, despite their size in the aggregate, have faced problems at many of their individual exchanges similar to those with which we are concerned. Perhaps you would be interested in what results these companies are obtaining from their operations. A review of the latest available financial reports of six "Class A" Independent companies, comprised of small exchanges and chosen solely for their locations in widely separated sections of the country, offers some enlightening information. These six companies operate a total of 211 exchanges averaging 226 stations each (the average number of subscribers per exchange is probably somewhat less). No exchange with more than 900 stations is operated by any of them and only 14 of the 211 exchanges have more than 300 stations. The reports for 1941 and 1942 show these six small-exchange companies earning an average combined return of almost 5 per cent per year on their plant valuation after paying expenses of operation, including charges for depreciation. Surely, any proof we may need that our case is far from hopeless and that small exchanges can be made to pay their way is to be found in records such as those.

There are a number of notable examples in our industry of successful small exchange management, both by the larger companies and by hundreds of smaller companies as previously mentioned. The plans they have followed and the methods they have developed and tested in handling their particular situations afford us a rich source of ideas and results data for the guidance of our efforts.

More than that, each of you will find, if you haven't already, that the individuals charged with managing the larger companies in your section, whether their own exchanges are large or small, have a genuine interest in the problems of the smaller companies. Their experienced counsel and assistance, either directly or through your state association, is yours for the asking. Such an attitude of friendly helpfulness is a recognized characteristic of all telephone people.

And now it appears that we have covered most of the preliminaries and all that remains to be done is to find the answers. Perhaps this is as good a time as any, then, to temporarily adjourn. Having established who we are, where we stand and how we got there, we have only to find our way out. That may not be easy but if yours is a normal territory of reasonable size and if you will apply to your own particular case the ingenuity that has marked the whole progress of telephony, we believe there *is* a way out. We will take up our efforts to assist you through these columns again at an early date and turn our attention then to discussions and planning of specific courses of action.

(To Be Continued)

>> *After watching American troops use the walkie-talkie field radio sets, natives of the South Sea Islands are convinced that our Signal Corps men have weird magic powers which enable them to talk to "iron birds in the sky."*

SMALL EXCHANGE CIRCUIT ANALYSIS

By Harry E. Chapman

Chief Dial Switchman, Intra-State Telephone Co., Galesburg, Ill.

PART XI. The tenth article in this series was published in the September 16 issue, page 16.

IN THIS part we shall analyze the Stromberg-Carlson Circuit No. B-20701. The circuit shown in *Fig. 1* contains seven relays and presents new problems. When a common battery line lamp appears on the switchboard, the operator places an answering cord plug into the associated line jack and the line lamp is extinguished. Referring to *Fig. 2*, note that the No. 1 relay operates, as the plug is inserted in a line jack, from ground on the sleeve through the 200-ohm winding of the cut-off relay. This operation also closes a circuit from ground at the 100-ohm winding of No. 1 relay, through contact B to the No. 2 terminal of the repeating coil. When relay No. 1 operates, closing contact C, battery is placed on the other side of the line through the 100-ohm winding of relay No. 2 to terminal No. 3 of the repeating coil.

The circuit may now be traced from ground, through the 100-ohm winding of No. 1 relay, through contact B, through the 2-1 winding of the repeating coil, tip of answering cord, ringing key, tip of jack, the line, through the subscriber's set, then back over a similar path on the ring side of the line through the 100-ohm winding of No. 2 relay to battery. This circuit provides talking battery for the calling subscriber, and the 100-ohm windings of relays Nos. 1 and 2 serve as battery feed coils. The low resistance "short," placed across the line by the subscriber's set, causes No. 2 relay to operate.

When the operator opens the listening key, she is connected directly across

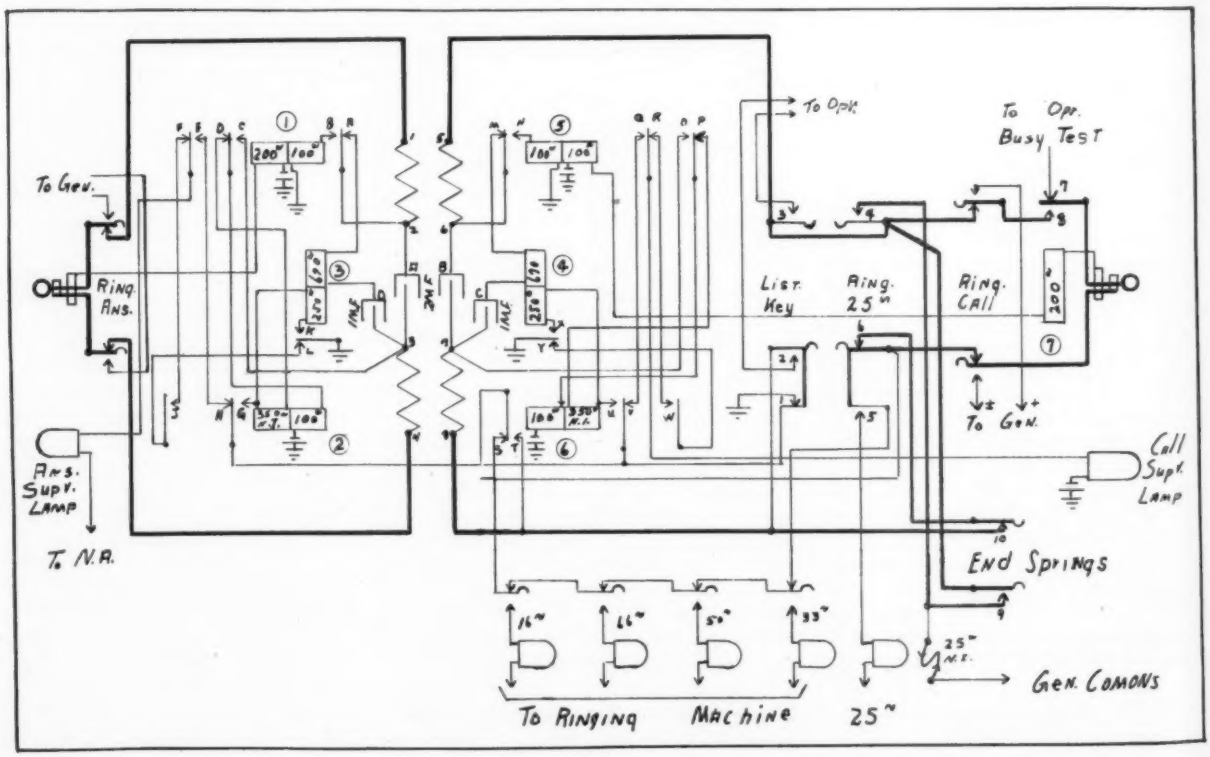
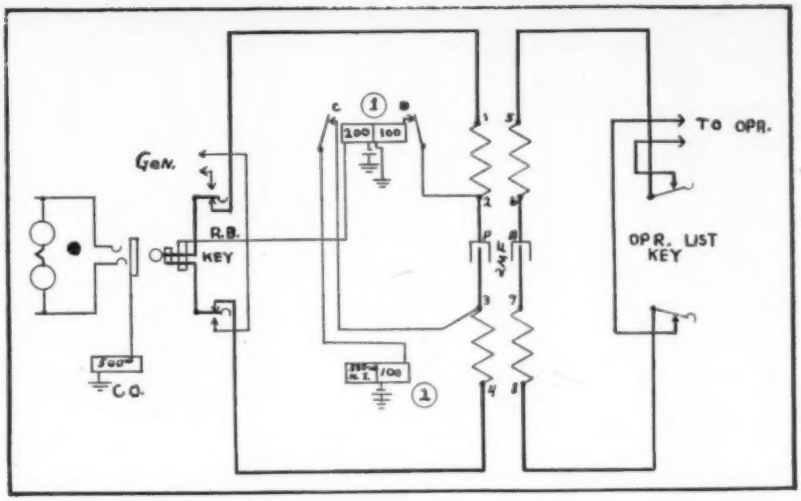


FIG. 1

FIG. 2



the repeating coil at terminals 5 and 8. The operator's talking battery is supplied from her own telephone circuit and will be discussed in a later article.

When the called line is ascertained, the operator, after taking a busy test, places the calling cord in the line jack. Should the tip of the cord meet battery before No. 7 relay operates, *Fig. 3*, the operator will be given a signal, a tone in her receiver and a light mounted in the key shelf. When the cord is placed in the jack, if it is a common battery line, Nos. 7 and 5 relays will operate from ground on the sleeve of the jack through the 50-ohm winding of the cut-off relay. When No. 7 relay operates, it closes the tip side of the circuit through to No. 5 terminal of the repeating coil. When No. 5 relay operates, it closes the circuit from ground, through its 100-ohm winding and contact N to terminal No. 6 of the repeating coil. Also, its O contact closes the circuit from terminal No. 7 of the repeating coil, through the 100-ohm winding of No. 6 relay to battery. Relay No. 6 does not operate until the called subscriber answers because it requires the subscriber's instrument "short" to complete the circuit, from battery to ground, before No. 6 relay can operate. The operation of No. 5 relay also closes its Q contact, lighting the calling supervisory lamp.

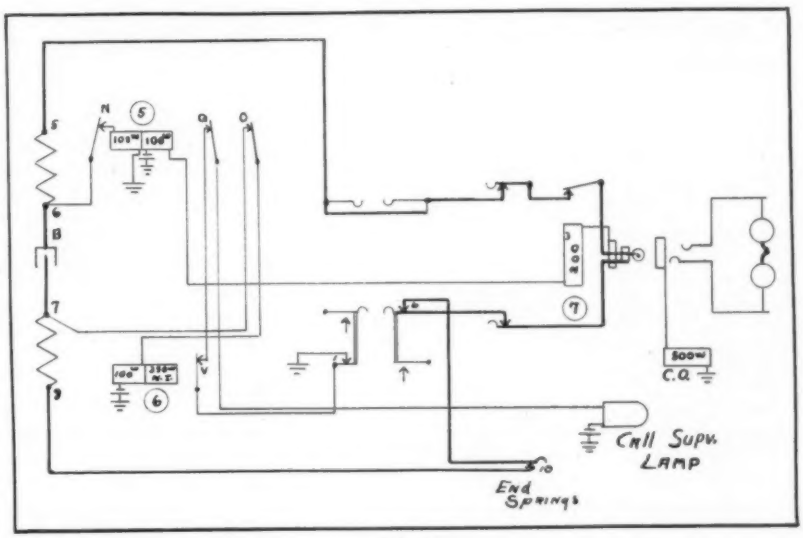


FIG. 3

The circuit is now prepared for ringing. If the party being called is on a harmonic line, the operator will select the ringing button to connect the proper frequency to the ringing key. The ringing key is then operated to signal the desired party. The circuit for ringing the called party is shown in *Fig. 4*. Ring-back tone is provided to the calling party over the path shown in *Fig. 4A*. The full ringing current is not permitted to reach the calling subscriber's ear, because half of the repeating coil, 7-8, is open at contact No. 10 of the end springs and also No. 6 contact of the ringing key. However, sufficient current will be induced in half, 5-6, of the repeating coil to give an audible ringing tone to the calling subscriber, assuring him that ringing is in progress.

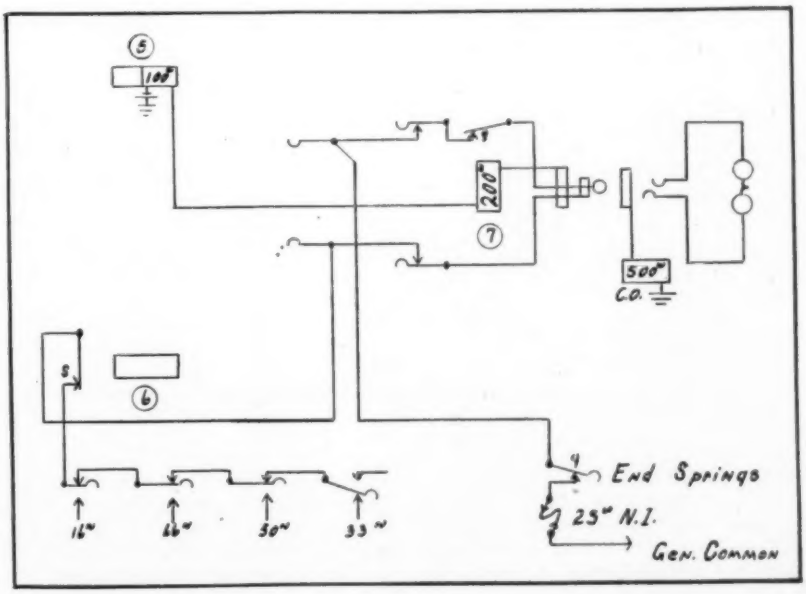


FIG. 4

When the called subscriber, *Fig. 4*, removes the receiver from the hook, No. 6 relay operates, opening its S contact, cutting off the ringing current. This prevents the called subscriber from being rung in the ear. The circuit arrangement will now be as indicated in *Fig. 5*. Talking battery is furnished the called party from battery at the

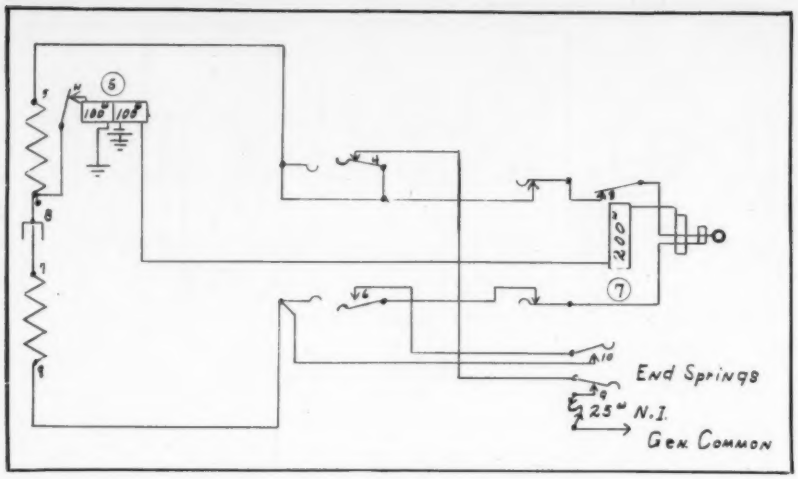


FIG. 4A

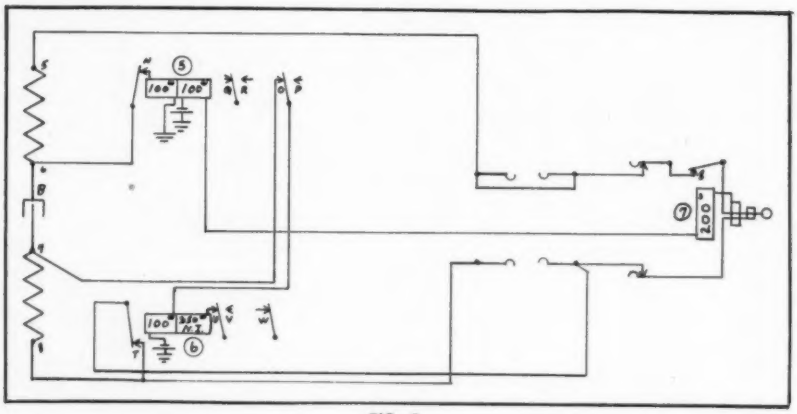


FIG. 5

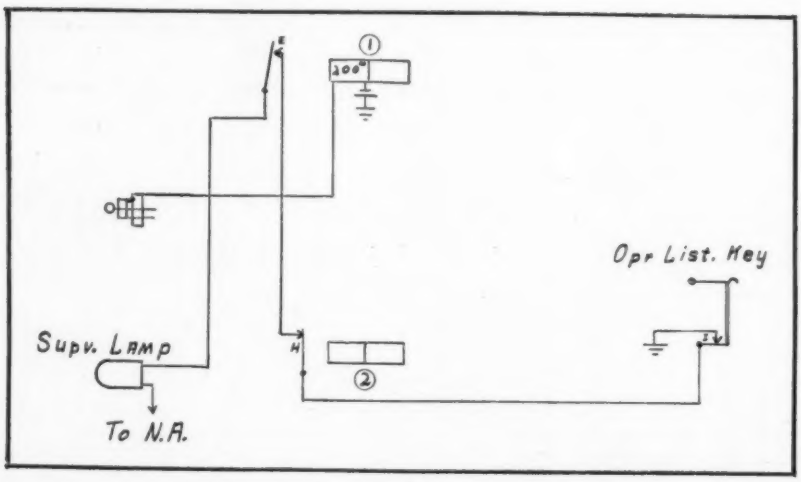


FIG. 7

100-ohm winding of No. 6 relay and the 100-ohm winding of No. 5 relay to ground. The 100-ohm windings of No. 5 and 6 relays serve as battery feed coils for talking battery to the called subscriber. When No. 6 relay operates, its V contact is opened, causing the calling supervisory lamp to be extinguished. This indicates to the operator that the called party has answered.

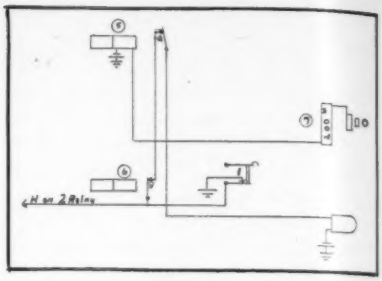


FIG. 6

When the called party hangs up, No. 6 relay restores to normal because the subscriber opens the circuit when he hangs up the receiver. The closing of contact, *Fig. 6*, again lights the calling supervisory lamp. This indicates to the operator that the called party wishes to be disconnected. The lamp is lighted from battery at the lamp, through contact Q of operated No. 5 relay and contact V to ground at No. 1 contact of the listening key. As the operator challenges the line, the opening of No. 1 contact removes ground and extinguishes the supervisory lamp.

When the calling party hangs up, *Fig. 7*, No. 2 relay restores to normal, closing its H contact and placing ground from No. 1 contact of the listening key, through contact H to contact E of No. 1 relay, to the answering supervisory lamp to battery and through the night alarm circuit. This indicates that this party also wishes to be disconnected. As the answering cord is removed from the jack, No. 1 relay restores, extinguishing the answering supervisory lamp, by opening contact E. When the calling cord is removed, Nos. 5 and 7 relays restore, extinguishing the calling supervisory lamp. All relays are again in a normal position.

When answering a call from a magneto or toll line, the answering cord is inserted in the line jack. Relay No. 1 is adjusted so it will not operate in series with the high resistance of the line sleeve relay which is usually either 1,500 or 2,000 ohms. Relay No. 2 is dependent upon the operation of No. 1 relay for its operation. Talking battery is not required as this is provided for a magneto line subscriber on his own instrument.

The talking circuit is shown in *Fig. 8*. The operator, by opening her listening key, talks to the calling party through the listening key, terminals 5 and 6, condenser B and 7-8 of the repeating coil, back to the listening key and the operator's telephone circuit. If the operator finds it necessary to ring the calling party or toll operator back on the line, it is only necessary to operate the ring-back key.

When the desired number is obtained

by the operator, the calling plug is inserted in the line and the operator rings by operating the 25-cycle ringing key as shown in *Fig. 9*.

When the calling plug is inserted in the line jack, No. 7 relay is adjusted to operate on all lines, but No. 5 relay does not because of the loss of current through the high resistance of the sleeve relay. Relay No. 7 only operates at this time. Talking battery is not required, so No. 6 relay does not operate as it depends upon No. 5 relay for its operation.

The talking circuit for toll to toll, toll to magneto, magneto to toll or magneto to magneto is shown in *Fig. 10*. It should be remembered that the same circuit is employed for magneto connections as for toll. When the called magneto or toll subscriber "rings off," ringing current, over the calling cord, finds that condenser B offers such a high impedance that it is by-passed over the circuit shown in *Fig. 12*. This circuit may be traced through the top half of the repeating coil, from terminal No. 6 to contact M of No. 5 relay, through the 670-ohm winding of No. 4 relay, through condenser C to terminal No. 7 and then through the lower half of the repeating coil back to the line.

Relay No. 4 operates, closing a circuit from ground through contact X and its 250-ohm winding, then through the 350-ohm non-inductive winding of No. 6 relay, contact P of No. 5 relay and the 100-ohm winding of No. 6 relay to battery. This will prevent No. 4 relay from chattering because of the flow of ringing current. Relay No. 6 will also operate and lock up from its own battery, through its 100-ohm winding, contact P of No. 5 relay, 350-ohm non-inductive winding of No. 6 relay and through contact U to ground at the operator's listening key.

The 250-ohm winding of No. 4 relay will now have ground on both ends of its windings. Ground from its own X contact will cause it to restore to normal. The called supervisory lamp lighting circuit will then be as shown in the dotted lines in *Fig. 12*. Contact Y of relay No. 4 will then be closed from ground, through contacts Y and W and contact R of No. 5 relay, through the calling supervisory lamp, causing it to light. This indicates that the called party wishes to be disconnected. The calling supervisory lamp will remain lighted until the operator opens her listening key, allowing No. 6 relay to restore to normal. This, in turn, opens contact W.

When the party rings off on the answering cord over the talking circuit as indicated in *Fig. 11*, the ringing current will be directed over the path

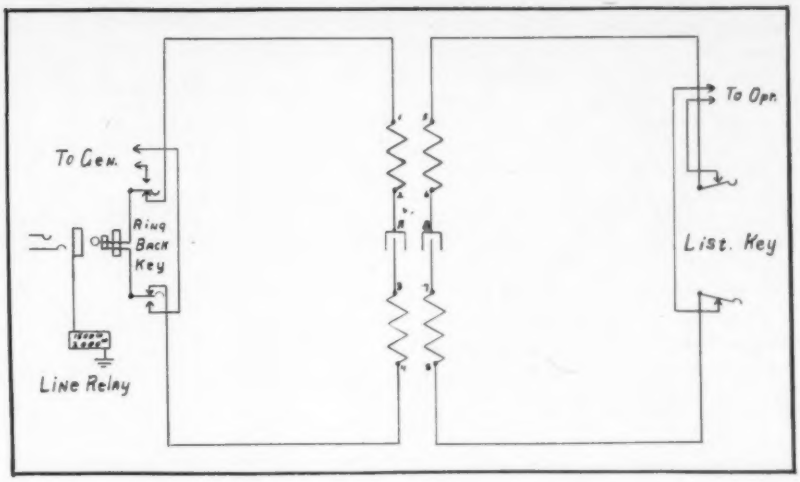


FIG. 8

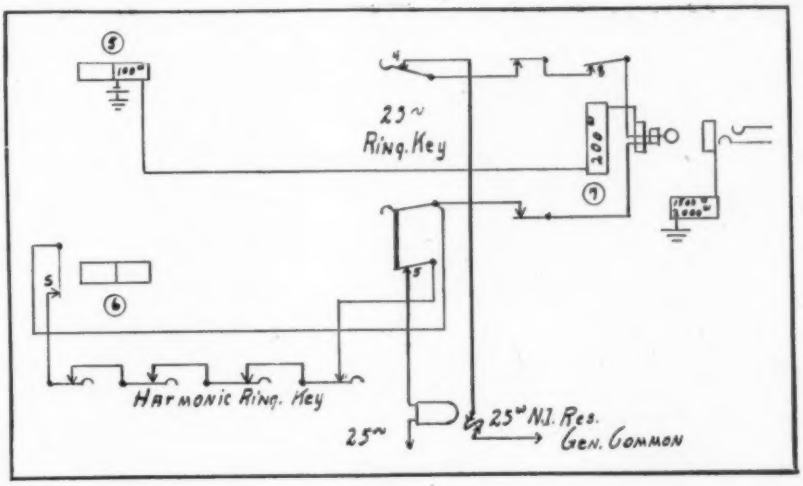


FIG. 9

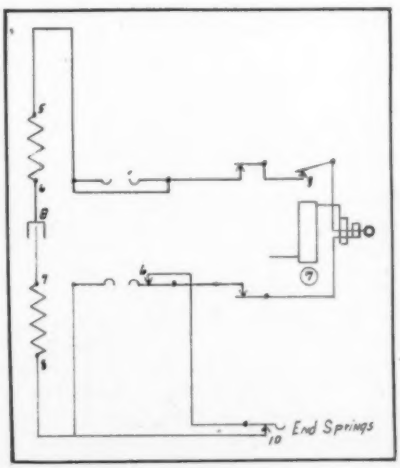


FIG. 10

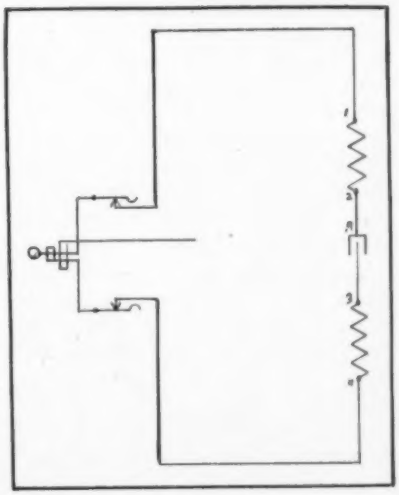


FIG. 11

shown in *Fig. 13*. Due to the high impedance to ringing current of condenser A, it will be shunted through contact A of the No. 1 relay, through the 670-ohm winding of No. 3 relay, through condenser D and back to the line. Relay No. 3 operates and is stabilized by ground through contact K of No. 3 relay, the 250-ohm winding of relay No. 3, the 350-ohm non-inductive winding of relay No. 2, contact D of No. 1 relay and to battery through the 100-ohm winding of No. 2 relay.

When No. 2 relay operates, the 250-ohm winding of No. 3 relay is shunted out because of ground on both ends of its winding. This relay will now restore to normal and set up the answering

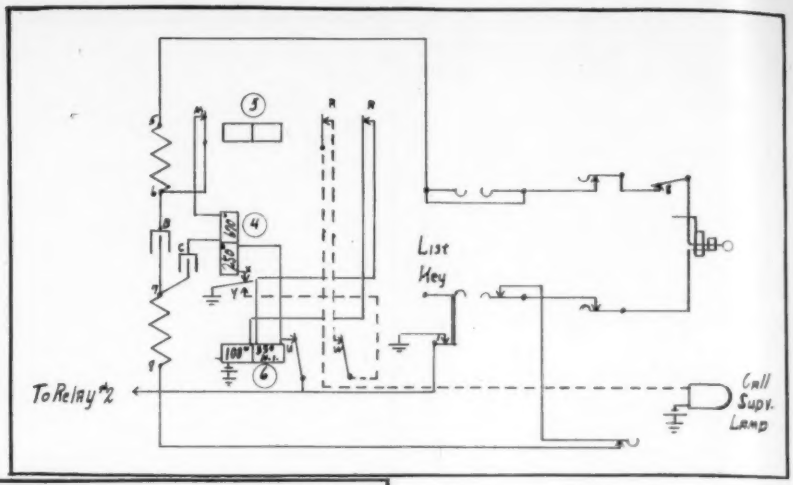


FIG. 12

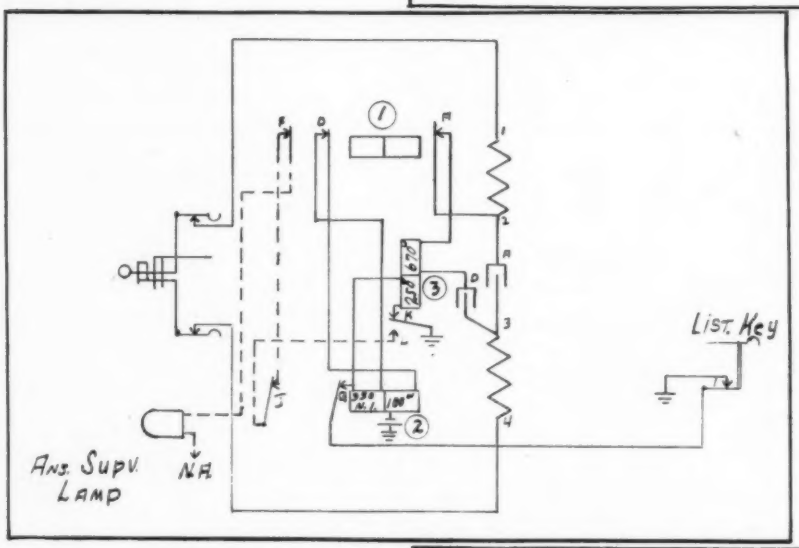


FIG. 13

supervisory lamp circuit as shown by dotted lines in *Fig. 13*. When No. 3 relay restores to normal, ground is placed on contact L through contacts J and F, lighting the answering supervisory lamp. This indicates that this party wishes to be disconnected. The lamp will remain lighted until released by the operator opening contact No. 1 at her listening key, which, in turn, will release relay No. 2, opening contact J at relay No. 2 and removing ground from the lamp.

On extra long line calls or when the transmission loss is extremely high, it is sometimes desirable to entirely remove the repeating coil from the circuit in order to reduce the losses to a minimum. Some switchboards are equipped with one or more cords with repeating coil cut-out keys, which are generally identified by having red handles instead of the conventional black ones. The key is wired into the circuit as indicated in *Fig. 14*. When the key is operated, contact No. 1 is opened, removing the condenser from the answering cord circuit. Contacts 3 and 2 are also opened to remove the calling cord section of the repeating coil from the circuit, closing contacts 4 and 5. This connects the tip and ring of the answering cord directly to the tip and ring of the calling cord. This arrangement removes any loss caused by the repeating coil from the cord circuit.

(To be Continued)

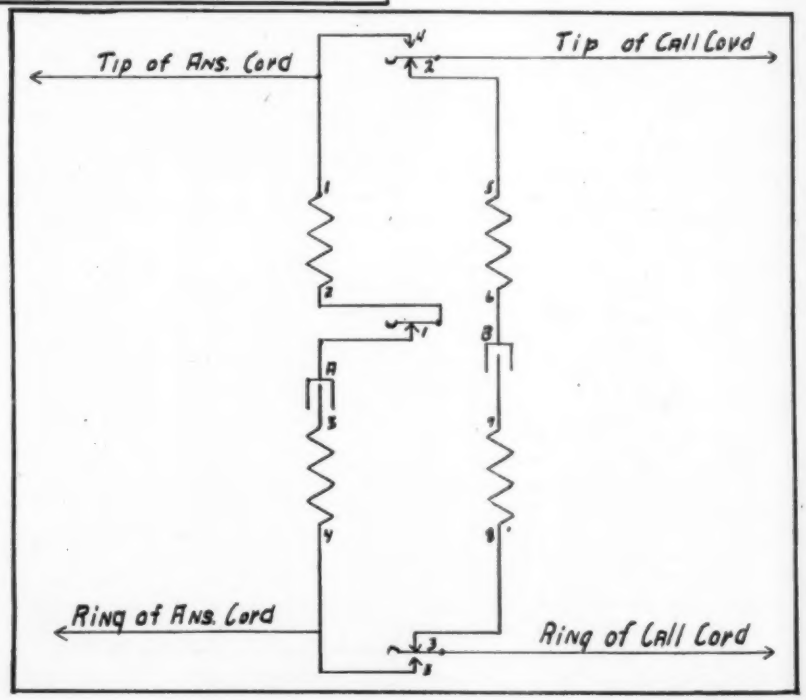


FIG. 14

G. I. JANES

of the Signal Corps

By RAY BLAIN

THE WOMEN'S Army Auxiliary Corps, later changed to Women's Army Corps (WAC), was inaugurated in May, 1942. WACs first served in the jungles of Washington, then England, North Africa, Italy and are now playing an important part in the liberation of France and other countries of Europe. They have proved the truth of the old saying, "The female of the species is more deadly than the male," by being good soldiers in the active theaters of war. WACs are frequently referred to as Eisenhower's secret weapon.

WACs, for the greater part, were working girls who quit good paying jobs to enter the Army. Many were formerly employed by various Independent and Bell telephone companies throughout the country. The qualifications and abilities of these girls have been utilized to good advantage in the Signal Corps.

Like all soldiers, WACs are assigned to duties for which they are best qualified to perform. There is hardly a noncombatant duty in which they are not now serving, and new fields are opening constantly. WACs are extensively used as telephone operators, but also perform many other important Signal Corps duties. They serve as photographers and photographic laboratory technicians. Due to an increased demand for WAC personnel for this type of work, an intensive photographic course has been established at a special WAC Signal Corps School at Fort McPherson, Ga.

WACs, now serving with the Signal Corps, are filling more than a score of non-combatant assignments for which they are especially qualified. Besides the large number of WACs who are working on telephone communications, others are on duty as radio and teletype operators, electricians, draftsmen, translators, mathematicians, radio repairmen and many other congenial jobs.

Portable field telephone operated by WAC operators. All are skillfully trained.

Early during World War I, the Signal Corps recognized the superiority of women as telephone operators on Army switchboards. It was also realized that numerous advantages were to be gained by using women to replace trained male telephone operators who could then become available for duty in the telephone exchanges in the combat areas near the front. A request was received by the Signal Corps November 8, 1917, for an organization of trained women telephone operators who spoke both French and English. With the cooperation of Independent and Bell telephone companies, over 450 women undertook a course of special instruction. Untrained women who had linguistic abilities were then trained in local and toll switchboard operation. Six operating units, consisting of a total of 223 of these operators, were sent overseas at various times during the first World War emergency. These operators, for the most part, were assigned to the larger offices and toll centers so their skill and training could best be utilized. The six operating units served at First, Second and Third Army Headquarters.

The Chief of the Military Personnel Branch, at the time of the inauguration of the Women's Army Auxiliary Corps in May, 1942, having had complete information of the good work performed by women telephone operators in France during our first World

War, advocated the use of WACs for similar duty in the Signal Corps during the present conflict. Surveys made at that time by the military personnel office and the War Manpower Commission clearly indicated that women could perform approximately 144 technical Signal Corps duties effectively. The manpower situation was acute and it was generally agreed that womanpower was the answer.

Surveys, completed by October, 1942, indicated a minimum of 2,000 Signal Corps enlisted men's jobs in overhead under the Chief Signal Officer which could be satisfactorily handled by WAC personnel.

A number of WACs were immediately placed on jobs formerly occupied by soldiers, thus releasing the latter for combat duty. Soon thereafter the voices of these women soldiers were heard on switchboards, both in this country and in overseas theaters of operation.

The first feminine AEF in American history landed in North Africa in January, 1943. In this group were a number of bilingual telephone operators who were heartily welcomed by our military leaders. These girls handled heavy telephone traffic in English, French and Spanish. The skill and accuracy of these operators accounted for the swift transmission of messages upon which the progress and success of the Tunisian campaign depended.

WACs, now on duty in England, have replaced personnel of the Women's Auxiliary Air Force, a British organization of uniformed women. These British women had been operating telephone switchboards at bomber command headquarters and other American stations. WACs now plot the missions of Allied as well as hostile aircraft in the secret plotting rooms of Air Force bases. They also handle telephone and teletype communications in other important Army centers, and their skill and dexterity have been highly commended by the Army.

When President Roosevelt and other American statesmen met with Prime Minister Churchill in Quebec in September, 1943, 29 WACs were selected to act as telephone operators and security mail clerks. The WACs proved their usual versatility on this difficult job. A need developed for skilled secretarial assistance and some WACs, experienced in that field, were assigned to these duties. They proved themselves to be as competent and efficient in this capacity as they were telephone operators.

The telephone operators avaraged 18 hours out of 24 on duty during the first three or four days of the conference. As a result of the excellent manner in which the WACs handled their jobs, commendations were given for each member of the group on duty there.

The following WAC personnel are presently serving as post Signal officers at Signal Corps installations:

Lieut. Alta R. Joffee is post Signal officer at the Carlisle (Pa.) Field

(Please turn to page 34)

These G.I. "hello" girls are WACs who operate the busy switchboard at an Eighth Air Force fighter station, somewhere in England.

Telephone exchange of Signal Corps telephone and telegraph station, operated by American girls, in World War I, La Belle, Seine, France.

THE FRIDAY HEADACHE THAT THREE CALLS CURED

Just when a quiet wind-up for the week looked promising, the bad news arrived. A jig press, ordered by the Army, must be ready to ship by Monday. And this was Friday, part of the day already gone, the jig press plant many miles away . . . and a headache very, very near.

The first telephone call found the press ready, ". . . all but a radial arm, which we ordered from a plant in Michigan, and another part which we think can be picked up in Danbury, but . . ." "Ship the press today without the missing parts." And that was that. The second and third calls located the missing parts, and . . .

On Saturday morning, machine and parts were speeding in from three different directions. By 8 o'clock, Monday morning, the press was assembled, set up, and ready to go . . . the job done . . . a headache gone. Just one of many production miracles made possible by telephone teamwork.

Every day the thousands of telephone workers are quietly and efficiently performing their wonders. And in Exide Batteries you will find the same dependability for which telephone service, itself, is famous throughout the world. Since 1895, Exides have been proving themselves worthy of that trust.

ARMY E NAVY

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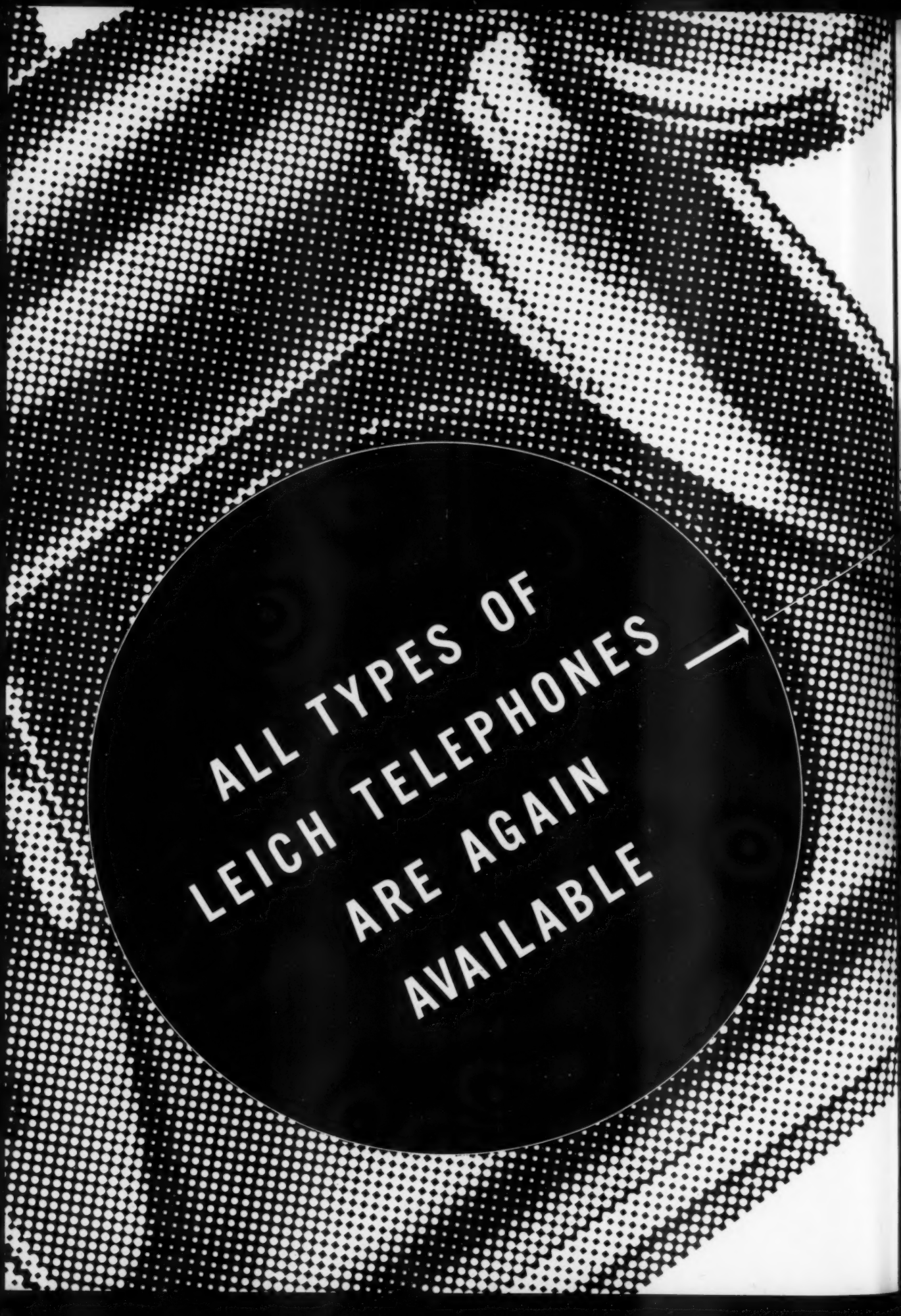
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LEICH TELEPHONES
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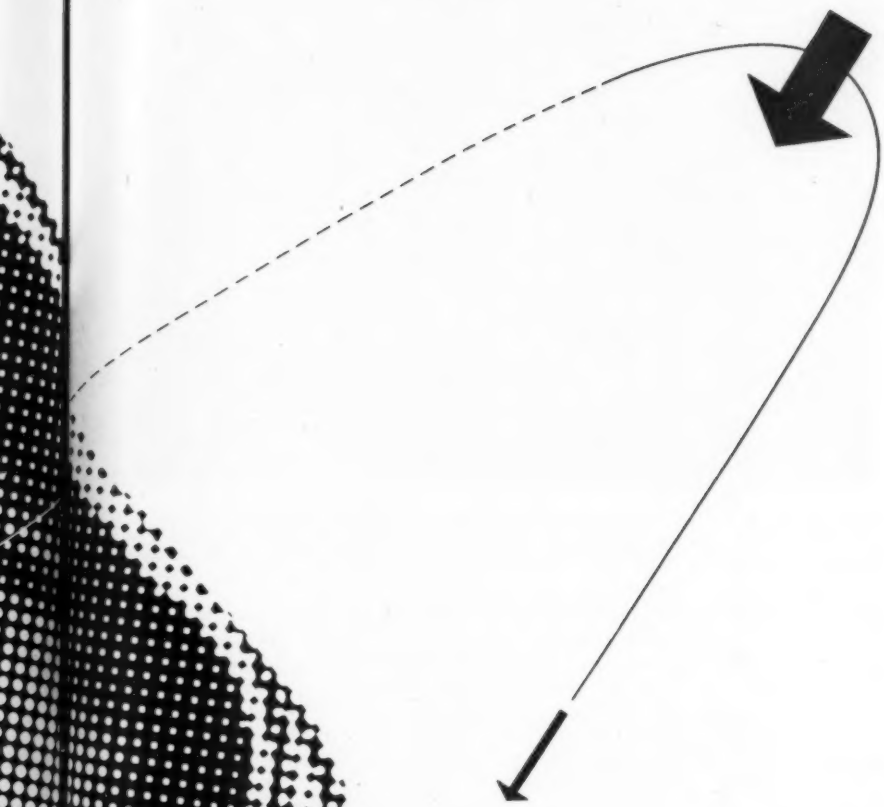

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MANUFACTURERS OF TELEPHONES, SWITCH-BOARDS AND RELATED APPARATUS SINCE 1907

** Subject to Current W.P.B. Regulations*

Medical School. Lieutenant Joffee has a telephone background and, according to Harry C. Starkweather, chief engineer for the Signal office, Third Service Command in Baltimore, Md., is doing an outstanding job on her present assignment.

Matilda F. Foehr, second lieutenant, Signal Corps, is post Signal officer at Holabird Signal Depot, Baltimore, Md. Lieutenant Foehr entered the service October, 1942, and was commissioned in April, 1943. She attended the Message Center and Cryptographic School at Fort Monmouth, N. J., in 1943. She was assigned to her present duties at Holabird Signal Depot, March, 1944. Her home is in Orlando, Fla.

All theater commanders have been high in their praise of the efficient service rendered by the WACs overseas and of the improvement they have effected in communications. Signal centers, both in this country and overseas, have been particularly insistent in their demands for WACs. Because of the great need for this person-

LIEUT. MATILDA F. FOEHR, WAC, post signal officer, Holabird Signal Depot, Baltimore, Md.

nel, the Signal Corps is participating in the station and job assignment recruiting campaign now being conducted by the various service commands.

Included in this campaign are the Eastern Signal Corps Training Center, Fort Monmouth, with a recruiting area covering the Second Service Command; Holabird Signal Depot in the Third Service Command; and practically all service commands for Arlington Hall, Washington, D. C.

A woman desiring to enlist in the Women's Army Corps for Signal Corps duty may request special assignment, subject to military emergency, to a special Signal installation within the service command area in which she enlists. Then, after six weeks' basic training at a WAC training center, she will be assigned to the Signal Corps station which she designated.

The Signal Corps provides excellent

WACs on duty in European theater of operations. (LEFT) PFC. DORIS L. OGDEN, Carlsbad, N. M., and PVT. JEAN L. YOUNG, Wilkes-Barre, Pa., are plotting the course of an approaching enemy plane over the coast and relaying the information to ack ack emplacements around the nearby field.

training which will be valuable in establishing a postwar career in the communications field. Information regarding the WAC and Signal Corps job assignments may be obtained from any Army Recruiting Office or by writing to the WAC Staff Director, Office of the Chief Signal Officer, Washington 25, D. C.

WACs receive Army pay—the same as men in the service. A WAC private gets $50 in cash every month. Her food, lodging and clothing are supplied free. In addition, WACs get all medical and dental services free. If they need medicines or hospital care, the Army provides them. They get all the extra benefits that men in the Army get, such as, life insurance at Army rates, free mail, "furlough rates" on railroad tickets, government prices at post exchanges and special rates at movies and theaters. WAC pay increases with each step-up in rank. Officers are paid from $150 to $333.33 per month, base pay. They are given additional compensation for quarters and rations.

WACs have been tried and found not to be lacking in the performance of their duties in connection with the winning of this, our greatest war. Recently, four WACs were awarded the Purple Heart for injuries received in a robot bomb explosion in England.

(Please turn to page 79)

Some of the first WACs on active duty in the Middle East. They have their own mobile sleeping quarters.

French telephone girl operating American switchboard at Langlois barracks during World War I. Signal Corps, Angiers, Maine and Loire, France.

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HEAD OFFICE: 1100 KING STREET, WILMINGTON 33, DELAWARE

ABC of the Telephone

By FRANK E. LEE

PART IV. The Telephone Transmitter. The third article in this series was published in the August 12 issue, page 19.

THE TRANSMITTER is the ear of the telephone. In the transmitter sound waves are changed into electrical waves which flow over the telephone line to the distant telephone. The normal current flowing through the transmitter is either weakened or strengthened by the operation of the transmitter, therefore, the transmitter is a form of rheostat. A rheostat is a device that controls an electric current by varying the resistance in the circuit.

The theory of rheostat operation is demonstrated by the device shown in *Fig. 1.* A piece of enamel insulated wire having considerable resistance is wrapped around a bakelite ring with one end terminated just off the ring on a frame. A metal arm supported in the center of the ring makes contact with the resistance wire. The insulating enamel has been removed from the resistance wire where it makes contact with the metal arm. A short lead connects the pivot of the arm to a connecting terminal near the terminating point of the resistance wire. With this arrangement, the metal arm can be brought in contact with any desired turn of the resistance wire.

When the handle is turned on the ring to place only a few turns of resistance wire in the circuit, the resistance of the rheostat is low. The resistance of the rheostat is increased by turning the metal arm to place more turns of wire in the circuit. (The schematic symbol for a rheostat was shown in Table I, Part I, published on page 19, May 27 issue.)

In *Fig. 2* is shown a circuit with a rheostat in series with a battery and ammeter. As indicated by the drawing, the arm of the rheostat is well to the right, and the current has to flow through considerable resistance. The meter indicates the current is of low value.

In *Fig. 3* the arm of the rheostat has been moved far to the left, and the meter indicates the value of the current has incresead. This increase in value of the current is caused by the lowered resistance in the circuit.

Another form of rheostat is the carbon pile rheostat. Carbon is the only non-metallic substance whose resistance is low enough to make it of practical use as a conductor. Unlike metals, carbon has the peculiar characteristics of having lowered resistance when under pressure. A carbon pile rheostat with carbon blocks placed between a stationary and a movable contact point is shown in *Fig. 4.*

The movable contact is attached to a thumb screw making it possible to apply pressure on the carbon blocks. The base is made of wood or other non-conducting material, therefore, the only path for current flow between the two contact points is through the carbon blocks. When the blocks are loosely packed, the meter indicates there is a current of very small value flowing in the circuit.

In *Fig. 5* additional pressure has

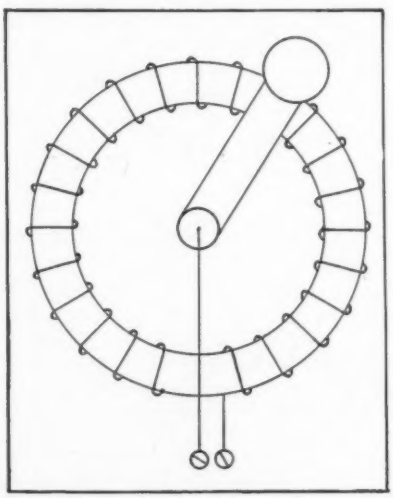

FIG. 1

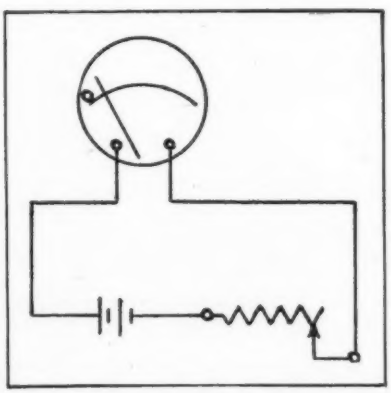

FIG. 2

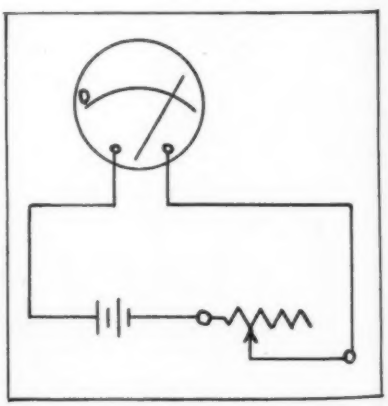

FIG. 3

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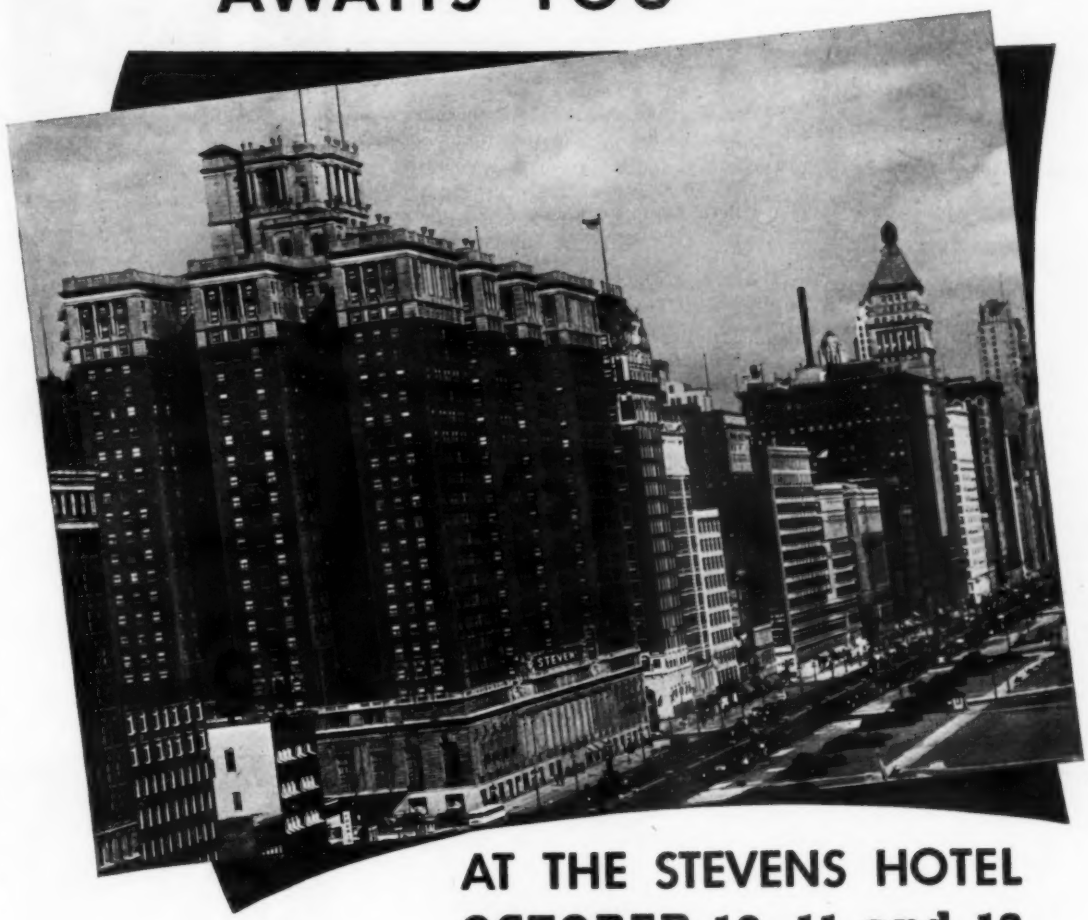

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been placed on the carbon blocks. The meter indicates the current flow has increased, which proves the resistance of the carbon pile rheostat has been lowered by applying pressure. An amazing feature of this test with the carbon pile rheostat is the minute change in pressure necessary to produce a definite change in the current flow. When the pressure on the carbon is released, the rheostat will again have

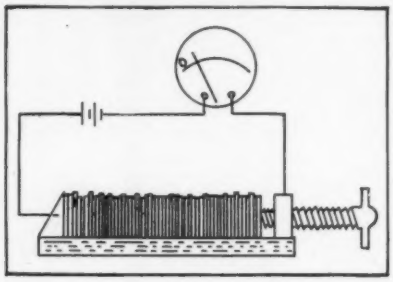


FIG. 4

high resistance and as a result the current will be lowered.

The telephone transmitter is a miniature carbon pile rheostat. It has a fixed contact or button and a movable contact or button that is actuated by a diaphragm which is sensitive to sound waves. In between the two contacts is a chamber filled with carbon granules. The contacts are insulated from each other, therefore, the only path over which the current can flow is through the grains of carbon. The movable contact is securely attached to the diaphragm, therefore, whenever the dia-

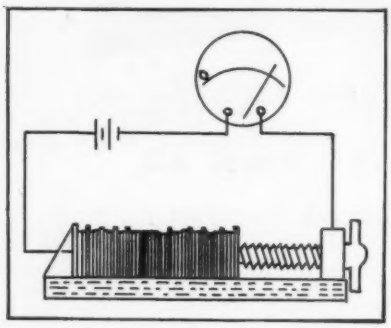


FIG. 5

phragm moves inward, the carbon is more closely compressed within the chamber. As a result, the resistance through the carbon grains is lowered and more current will flow through the transmitter. The current is said to be increased more than normal flow.

When pressure on the diaphragm is released, it will momentarily snap out further than its original position. The carbon granules will be under less pressure than normal and the resistance of the transmitter will be momentarily greater than normal. The current flow will be less than normal.

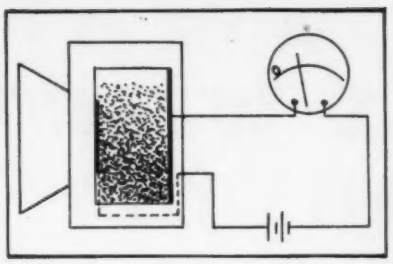


FIG. 6

The diaphragm of a transmitter is made of lightweight phosphor bronze, duraluminum or other similar material, with the center strengthened by an extra inner cone of the same material or corrugated to act as a stabilizing element. The flexible outer edge is securely clamped in the transmitter housing. With this construction the diaphragm moves in and out at the center like a piston instead of fluttering

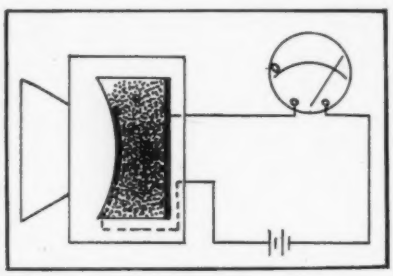


FIG. 7

as would a thin sheet of metal when held in one hand and tapped with a stick of wood. Inasmuch as the diaphragm is sensitive to sound waves the carbon granules are compressed and released in coordination with the pressure placed on the diaphragm by the sound waves.

Fig. 6 illustrates that, when the transmitter diaphragm is in a normal position, the carbon granules exert pressure between the two electrodes due to the force of gravity, and as a result, current flows through the transmitter at a normal rate.

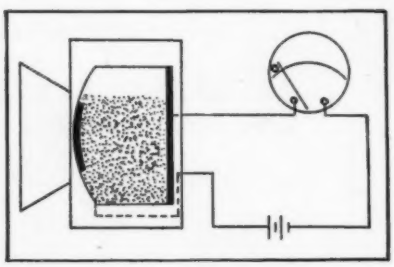


FIG. 8

When the transmitter diaphragm moves inward, *Fig. 7*, the granules are pressed closed together, and, as the meter indicates, the current flow is greater than normal.

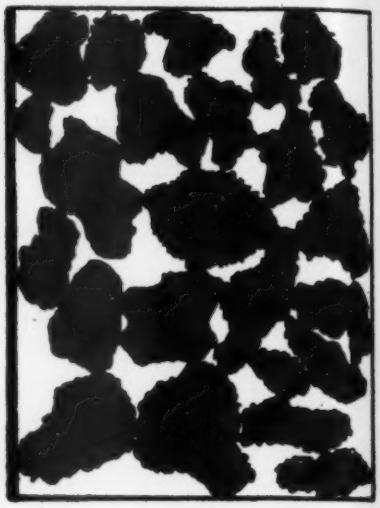


FIG. 9

On the reflex movement the diaphragm moves outward and the increased resistance in the transmitter results in a current flow less than normal, as shown in *Fig. 8*.

An enlarged section of a few carbon granules with the diaphragm in a normal position is shown in *Fig. 9*. The granules are of irregular size and shape with many tiny edges on each

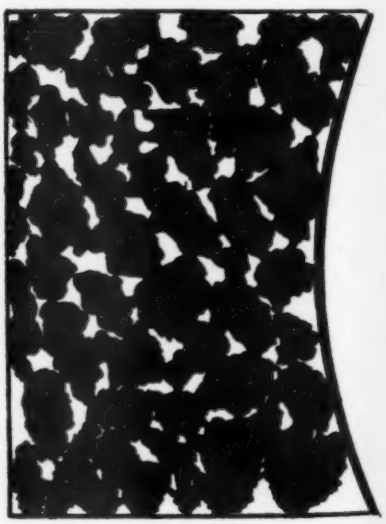
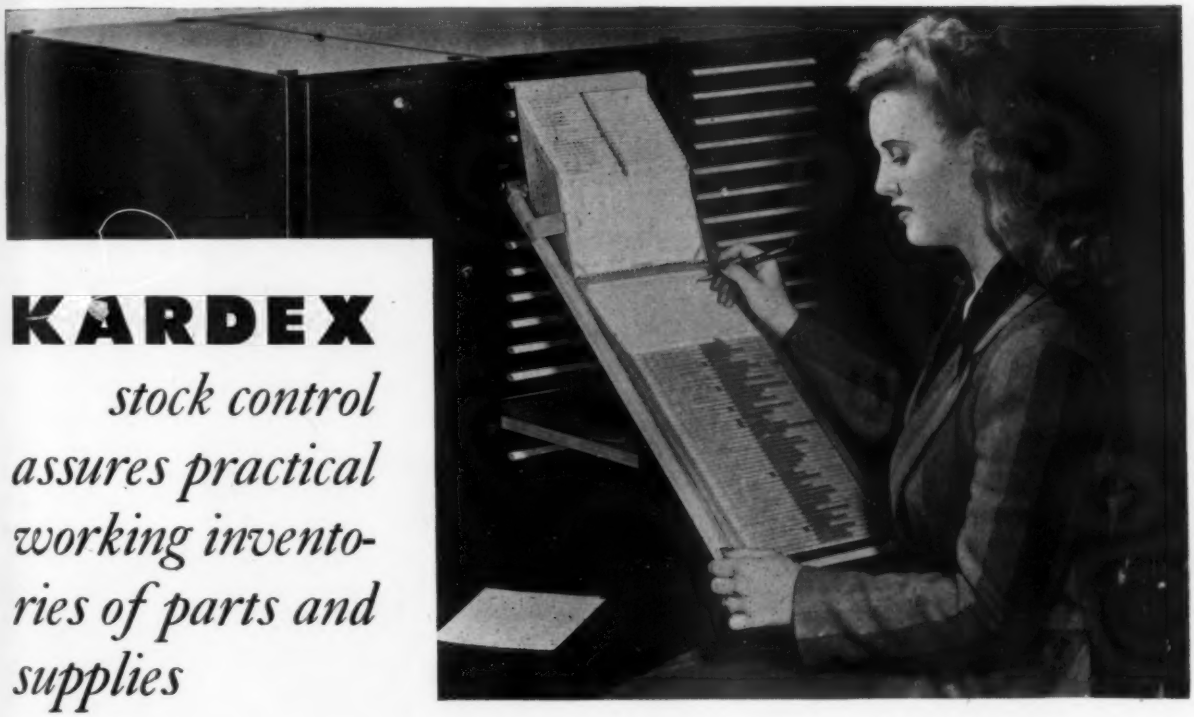


FIG. 10

grain. It will be further noted the grains, although finer, resemble granulated sugar or cinders rather than sand which has round grains with polished edges. With only a relatively few edges

(Please turn to page 46)

At the **FOCAL POINT** *of construction and maintenance operations*



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THE Recordgraph* is also invaluable for recording the proceedings of Conferences, Conventions, and Sales Meetings, for Sound Analyses, Training Purposes, in Control Centers, Mobile Equipment, and wherever permanent recording of Sound, Speech, or Code is desired; for training operators, checking their speech, manners, efficiency, and for taking inventories, recording dispatching orders and instructions.

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This is the famous film recorder that made the well-known D-day Invasion recordings that were broadcast over all four networks and throughout the world many times. Since then, Recordgraphs* have been used by leading radio war correspondents to make many of the colorful on-the-spot recordings of the advancing Allied Forces, which you have heard over major networks, including several from liberated Paris and Guam.

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The new Recordgraph* is an extremely compact, self-contained, portable unit weighing about 50 lbs. Provides hours of continuous recording without changing media . . . many more of intermittent recording. Operation unaffected by even extreme vibration.

This recording is permanently embossed on Amertape*, 35 mm. plastic . . . not photographic . . . needs no processing. Any portion can be located instantly and played back as often as desired. Fine for training operators. Important for recording dispatching orders and instructions by power and utility systems.

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A Recordgraph* in action near the fighting front in Guam.

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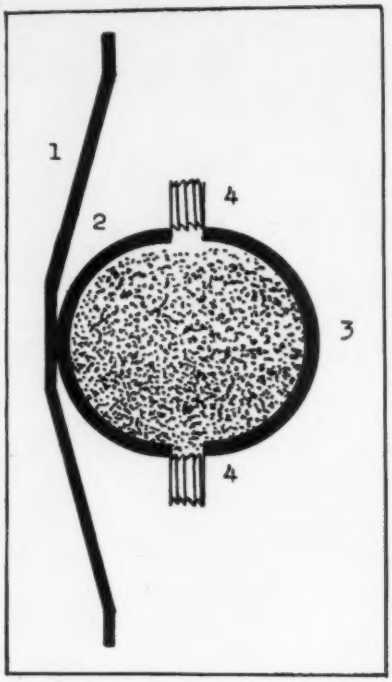


FIG. 11

in contact, the current has but few paths through the carbon chamber.

The carbon granules under pressure in *Fig. 10* offer more paths to the flow of electric current, therefore, the combined resistance of the unit is greatly reduced allowing a corresponding increase in current flow.

Carbon is the only material that most nearly meets all of the requirements of a microphonic material. It is extremely hard, which enables it to withstand years of use without becoming polished round by the continual friction encountered as the grains are shifted around in the chamber. It cannot be fused or welded into a solid lump, therefore, the current flowing through the transmitter will not cause the individual grains to adhere to each other. Carbon is a substance of inert nature and as a result can be made practically free of impurities. Also, carbon will not corrode in the air, therefore, a transmitter will function in almost any humidity or climate.

Carbon granules, like grains of sand or salt, are free running only when they are dry. Therefore, the completed transmitter assembly must be effectively sealed against moisture. A moisture-proof diaphragm is generally placed in front of the main diaphragm. All points are sealed with moisture-proofing compound and, if protective caps or retainers are used, they are also designed to keep out moisture.

Unlike a liquid which exerts an equal pressure in all directions, the friction between the separate grains causes the carbon granules to exert more pressure in a vertical direction than in a horizontal direction. In order that the transmitter can be used in any position, the carbon chamber must be constructed with rounded walls, such as a ball cut in half, and then reassembled with an insulator between the two segments which would permit the front portion attached to the diaphragm to move freely. This theory, illustrated in *Fig. 11*, provides for adequate contact between the two electrodes in any position.

Another type transmitter design, *Fig. 12*, places a "U" shaped front contact within a "U" shaped back contact, which also is the carbon chamber. This design also provides adequate contact between the two electrodes in any position.

Both of the foregoing designs change the pressure on the granules depending upon the direction of the diaphragm movement. It will be noted further that the application of pressure is nearly equal in all directions. If the electrodes had flat surfaces the pressure would be greatest in the direction of movement, and, as a result, the movement of the diaphragm would not create as much of a change in the resistance through the carbon chamber as when the surfaces are rounded.

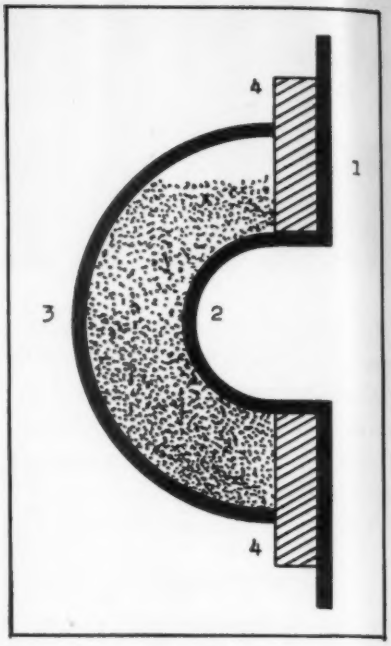


FIG. 12

With these many improvements in design, the modern transmitter is an important reason why today's telephone, in comparison with the older style units, has a decided increase in volume with a corresponding improvement in fidelity.

Small Company Rates

"Several of the smaller companies still have in effect comparatively low exchange rates, some companies having rates as low as $1.00 per month. These low rates cannot sustain good telephone service and sound operations, which make these conditions of concern to the association. With operating costs on a gradual rise, the revenues of many of the smaller companies have not kept pace and the result is that the worth of the telephone plant is being absorbed in the operation of the company. Consideration should be given immediately to the adequacy of exchange rates to provide a high quality of service and a fair return to the investor."—Don Walker, executive secretary, New York State Telephone Association.

★ ★ ★

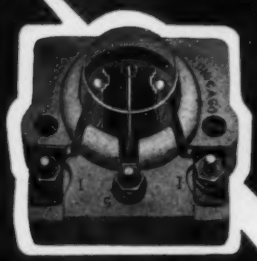
Public Relations

"I believe there is just one way to handle public relations and that is to keep those relations so good that no build-up is really necessary for such things as rate increases. In other words, have the public so sold on the policies of the company that no one questions a change of any kind. There may be shortages of certain things, but anyone will find plenty of courtesy, patience, attention, smiles or goodwill, if he just takes the receiver off the hook or pokes his nose into the office of the Farmers' Telephone Co. at Riceville, Iowa."—C. C. Pearce, manager, Farmers' Telephone Co., Inc.

COOK

INTERIOR SUB-STATION PROTECTION

Illustrated here are three low cost Cook protector units for interior sub-station protection.



TYPE NO. 2

The No. 2 Arrester consists of a solid piece of glazed porcelain fitted with Everdur binding posts, nuts, washers and phosphor bronze springs. Arresters are non-grounding Tru Gap Dischargers set in a recess and covered with a vented metal cap.

TYPE B-7

Base is of porcelain on which are mounted phosphor bronze contact springs. Screws, nuts and washers are of Everdur. Tru Gap Dischargers and vented metal cap same as on No. 2. Equipped with A-9 3 Amp. fuses.

TYPE B-13

This protector can be adapted to either a long or short fuse. Consists of two pieces of porcelain, one carrying fuse clips for the line end and the other for the instrument end. Lightning arresters are the same type as used on the No. 2 and the B-7.

Since 1897 Cook Electric Company has been manufacturing a complete line of telephone protective and distributing equipment for the independent telephone industry. Cook products have proven their dependability in the field. When you want the best—reach for the Cook catalog, the best line for your lines.

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by MAYME WORKMAN
traffic supervisor
the Illinois Telephone Association
and traffic editor

THE OPERATOR'S CORNER

GENERALLY speaking, calls placed in connection with fire, flood, wreck, tornado, riot, serious accident or illness, death or any disaster or emergency requiring the aid of police, fire department, hospitals, doctors, ambulance or life saving service, militia, municipal or other government authorities, etc., and calls from utility companies in connection with power or pipe line failures, are classified as emergency calls if the calling party indicates that an emergency exists.

When the operator receives an emergency call, she should give it her undivided attention and do everything possible to help.

The operator should notify her supervisor or chief operator as soon as possible, without delaying the completion of the call, that she is handling an emergency call, giving her the nature of the emergency.

On an emergency call, waive all requirements in regard to charges that might delay the start of conversation, extending credit until the call has been completed.

On a long distance emergency call, the operator should enter "emergency" in the "Special Instruction" space.

At the first opportunity, without delaying the call, the operator should ask the calling party for his name and address, entering this information on the back of the ticket, together with an explanation of the operator's failure to secure a deposit.

The supervisor should keep in close touch with the progress of an emergency call and should give any advice or assistance necessary to either the operator or the calling party in reaching the desired station. At the first opportunity, the supervisor should enter the nature of the emergency on the back of the ticket with her personal number.

The special treatment accorded emergency calls should be familiar to all employes on the operating force. This so-called "special" treatment consists, basically, of continuous supervision until the case is reported and voluntarily rendering reasonable assistance in summoning aid.

If any operator having occasion to handle an emergency call will apply these principles and normal good judgment based on her operating experience, the results will be satisfactory.

Questions from Illinois Operators

(1) Should an operator put a "T" on a collect ticket after passing it to her tributary?

(2) What responsibility is generally assumed by operators in handling emergency calls such as fire, police, doctor?

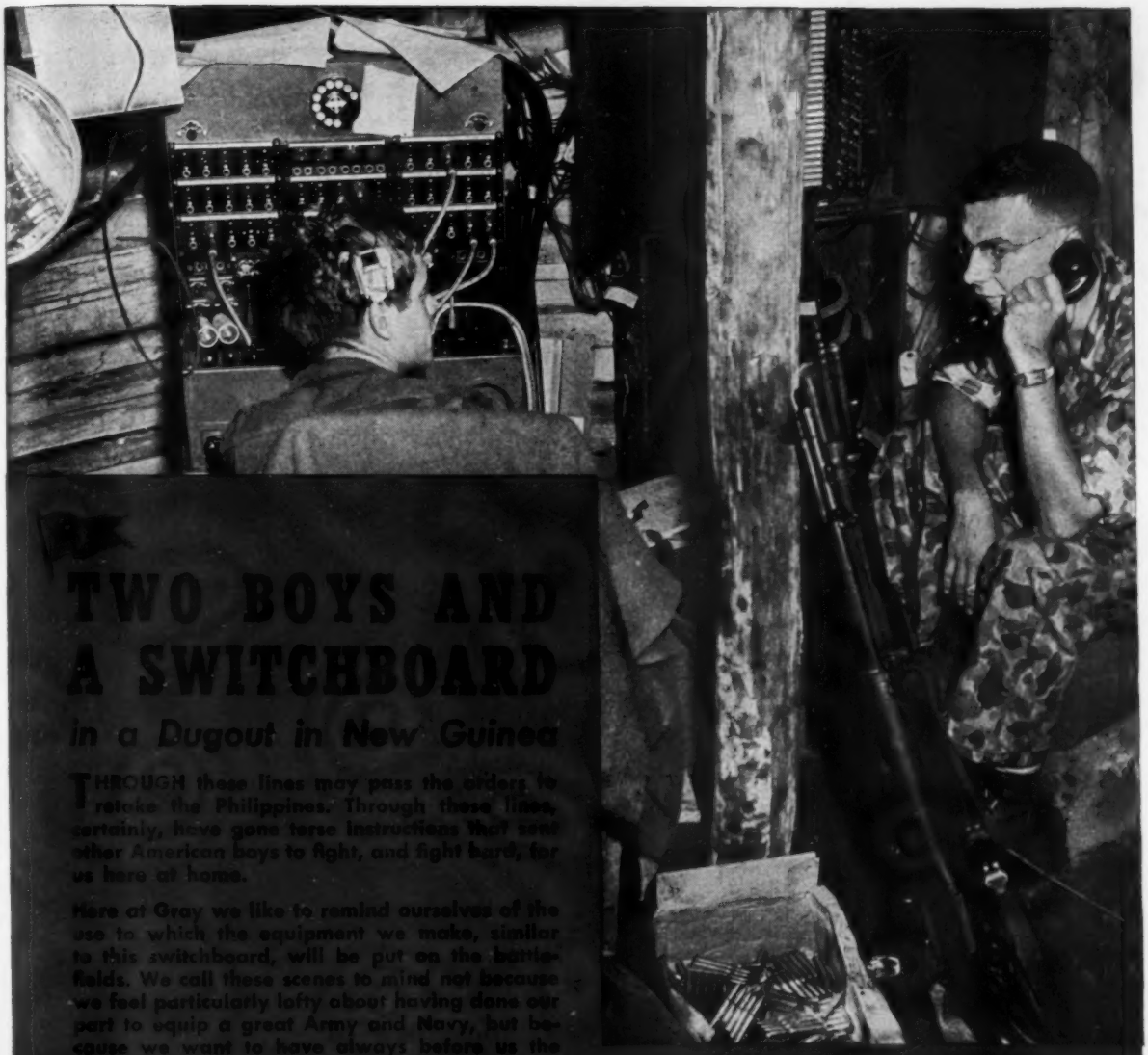
(3) After conversation, the call is made collect. Should you cross out the rate on your ticket?

(4) On a call to a third station which is a ringdown, is the call MX?

(5) On a collect, station-to-station call where there is no one to accept the charge, what happens?

The answers to these traffic questions are presented on page 88.

(Courtesy, Public Service)
"I don't like to scold, but the management prefers 'hold the wire' instead of 'keep your shirt on.'"



TWO BOYS AND A SWITCHBOARD

in a Dugout in New Guinea

THROUGH these lines may pass the orders to retake the Philippines. Through these lines, certainly, have gone terse instructions that sent other American boys to fight, and fight hard, for us here at home.

Here at Gray we like to remind ourselves of the use to which the equipment we make, similar to this switchboard, will be put on the battlefields. We call these scenes to mind not because we feel particularly lofty about having done our part to equip a great Army and Navy, but because we want to have always before us the realization of what tremendous quantities of equipment are needed, and how little we can do, really, however hard we try, of the big job that still remains.

No calls from a Gray pay station will ever go through this board. But we know that by making such switchboards and other equipment we are adding just a little to the tremendous output of American industry which will help to bring back the day when companies like ours and yours can return to making for the free people of the world what they want to use, rather than what they have to use.

THE GRAY MANUFACTURING COMPANY

W. E. DITMARS, PRESIDENT

MAKERS OF TELEPHONE PAY STATIONS SINCE 1891

HARTFORD, CONNECTICUT : 230 PARK AVENUE, NEW YORK

Authorized Agents . . . Automatic Electric Sales Corp. • Graybar Electric Company • Kellogg Switchboard & Supply Company • Leich Sales Corporation • The North Electric Mfg. Co. Stromberg-Carlson Company • Automatic Electric (Canada), Limited • Northern Electric Co., Ltd.

STROWGER AUTOMATIC TELEPHONE EQ

First on Post-War "Want Lists"

Telephone managers' "want lists" for the future have grown tremendously since wartime shortages have prevented all but the most essential purchases. Heading many of these lists is STROWGER AUTOMATIC TELEPHONE EQUIPMENT.

For every telephone switching need—in large exchanges and small—in private branch exchanges and widespread toll networks—Strowger Automatic has become the standard of progressive operating organizations. During these war years, they have seen Strowger Automatic equipment continue, in spite of heavy traffic and reduced personnel, to render fine telephone service at low cost.

Now is the time to perfect over-all plans for *your* postwar needs—and to build those plans around Strowger Automatic. We are ready to help you in every way we can without interfering with our production for war. Consult our field representative, or write us direct.

AUTOMATIC ELECTRIC

Originators and Developers of Strowger Step-by-Step Machine Switching Automatic Dial Systems
Makers of Telephone, Signaling and Communication Apparatus . . . Electrical Engineers, Designers and Consultants

Distributors in U. S. and Possessions

AUTOMATIC ELECTRIC SALES CORPORATION, 1033 W. Van Buren St., Chicago 7, U. S. A.
Export Distributors: INTERNATIONAL AUTOMATIC ELECTRIC CORPORATION

CENTRAL OFFICE EQUIPMENT

Strowger Automatic Telephone Equipment economically meets every modern service need in exchanges of every size, and provides maximum flexibility for meeting growth or change, in traffic or number of stations. Standard apparatus units, in a wide variety of types and mountings, can be arranged to provide the combination best suited to your specific needs.

PRIVATE AUTOMATIC BRANCH EXCHANGES

Provide business organizations with a combination of fast, modern dial service on interior calls and supervised service on incoming and outgoing city and long distance calls. P-A-B-X equipment is available in types and capacities to meet every requirement. Larger units may be equipped, when desired, for special communication and control services to meet individual needs.

COMMUNITY AUTOMATIC EXCHANGES

We offer a complete range of unattended automatic units for small exchanges, providing modern, four dial service on local calls, and fast, convent toll service through your attended exs or those of connecting companies. C-A-X ent is especially designed to meet small- e conditions, and is adaptable to individnges or networks.

TOLL SWITCHING EQUIPMENT

Use of Strowger Automatic equipment in toll switching speeds up toll service, improves toll line efficiency, saves operating costs, reduces errors and delays. Typical of modern Strowger developments in this field is the Automatic Toll Board illustrated above, consisting of simple manual positions for the control of automatic toll switching apparatus.

SCIENCE IN *Signal Corps Development*

By MAJ. GEN. JAMES A. CODE, JR.

Assistant Chief Signal Officer
United States Army

In this article, reprinted from the July, 1944 issue of *The Scientific Monthly*, General Code compares the limited development of military equipment during prewar years with the tremendous designing of such apparatus since the United States entered the present world conflict. He pays tribute to private scientific and manufacturing business for its cooperation in supplying modern equipment to the Signal Corps.

WHEN IT became evident that the world was going to war, there was no class in this country that started to mobilize more quickly than the scientists. During 25 years in response to technological advances we had revolutionized our habits of eating, transportation, clothing, entertainment and communications. It was clear that our methods of warfare must similarly be revolutionized; our scientists and engineers were among the first to recognize that this must be so, and offered their services to that end. They asked only that the armed forces define the needs for them to supply.

The decision as to how they could best be used was largely a military problem. It was not a problem that could be solved once and for all. Even if it were possible to forecast the entire course of a war in advance, it must pass through varying phases wherein the emphasis on the use of science and scientists will shift. Without such foreknowledge the problem becomes much more complex and uncertain.

Every soldier wishes that, when war does come, he could enter it with his arms and equipment fully developed and in full production. Only in a wholly militaristic country, bent on conquest, is this even approximately possible; in a democracy it is entirely out of the question and therefore, when the European war did come in 1939, we started from scratch. This meant that we had to carry on, simultaneously, all the consecutive steps of technological progress from basic research, through invention and development, to production.

Nowhere has this been more evident than in the Signal Corps, for we are now using, daily, effects that were only hopes five years ago and that we certainly did not then know how to produce. When we have developed a new technique, we must at once find means to combat it if it should be turned against us, as it certainly will be if the war continues long enough, and so research, invention and development must continue side by side even after our Army is fully equipped.

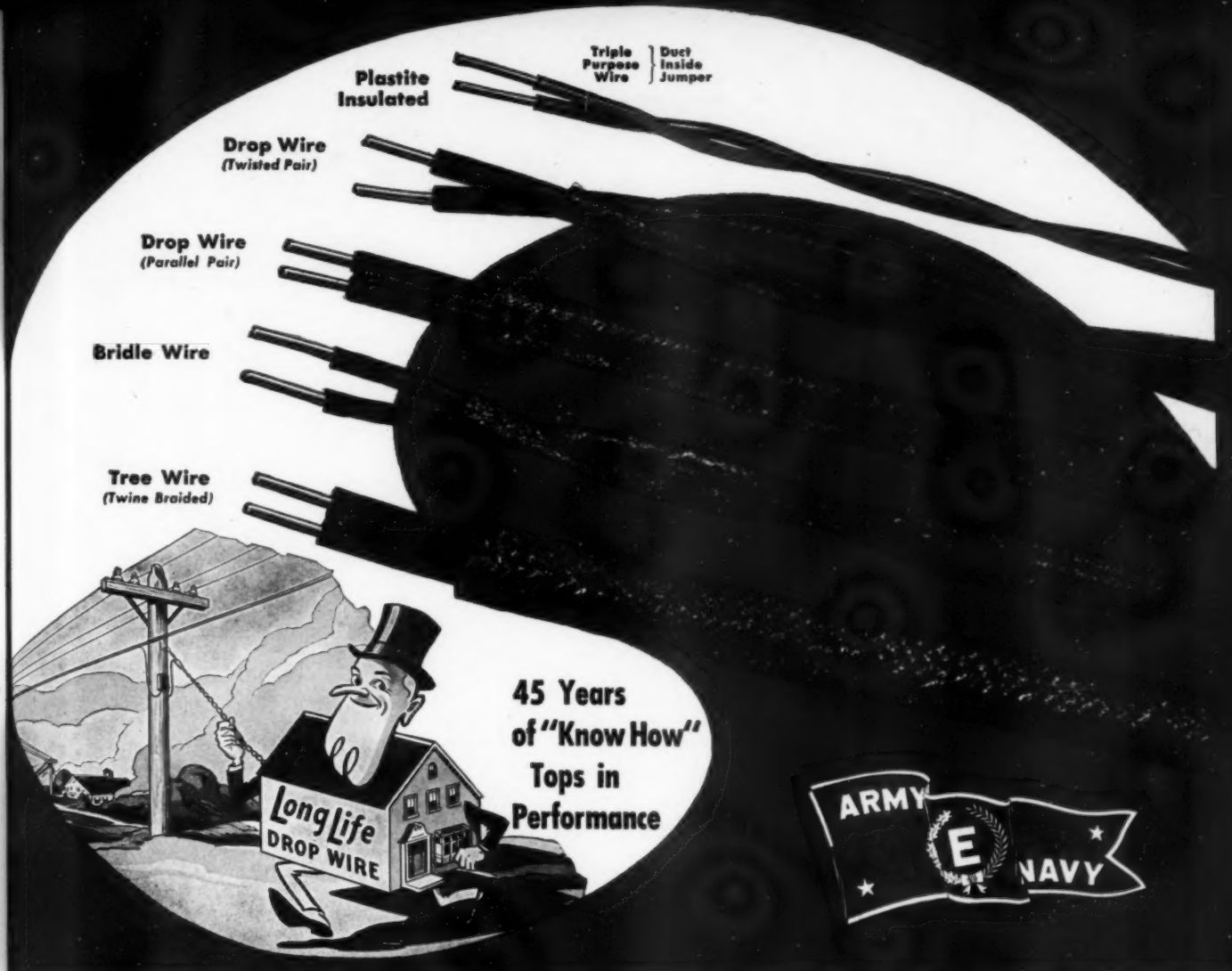
MAJ. GEN. JAMES A. CODE, JR.

At the moment, our only mission is to win this war. Our most fundamental need to that end is scientific brains to carry out every one of the steps from basic research through production, for it is not until the last step has been taken that the first step contributes its share toward the objective.

We can conceive of someone, after the war, drawing a family of curves showing the value to the war effort of research, invention, development and production in accordance with the epoch of the war at which they were carried on. Such curves would rise successively to their peaks, hold these peaks for a while, and then decline until the first of them, research and invention, assumed negative values, these activities having diverted manpower from others, while their results were achieved too late to be used in the field.

In actuality such graphs would mean little or nothing. In the first place, we have no knowledge as to the time scale. More important, however, is the fact that it may be the last development to come into use which by achieving strategic or tactical surprise wins the decisive battle and ends the war. Timeliness may be of far greater value than extent of use.

Discounting our graphs we can still see that the process from research to production passes through various phases and although we cannot state at what instant we pass from one stage to another, we can state that the first



LOWER COSTS *and* BETTER SERVICE!

Long Life **Telephone Wire** lives up to its name and reputation. The experience of nearly half a century, together with constant laboratory and field tests, has provided a knowledge of Insulated Wire manufacture which enables WHITNEY BLAKE to produce Telephone Wire of highest uniform quality, and greater strength. It is well named ***Long Life***

Maintenance costs are lowered and better service is assured when you use WHITNEY BLAKE Wire. Look for the famous WB trade mark.

Graybar Distributed by Graybar Electric Company

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WB

THE WHITNEY BLAKE CO.

New Haven, Conn.

Wire distributed by GRAYBAR in over 80 principal cities

phase is now definitely past. We are beyond the point where we merely knew what technological results we wished to accomplish and were supported only by an inner confidence that we could devise and produce the equipment with which to do it. We have reached a stage where we can produce, and are producing, equipment as fast as we can train men to use it. We know, by experience, that our equipment is, in general, as advanced as any in the world. Therefore, a change in emphasis has taken place in our development program. What this change in emphasis means can best be appreciated by a few illustrations of what has been accomplished in the earlier phase.

In 1934 the Signal Corps was given, by Congress, $170,080 for its entire research and development program. This total budget was approximately equal to our present annual expense for friction tape to insulate the splices in our wire. That year it became evident that Hitler was preparing for war, and so in the following year we were given about $42,000 more with which to start advanced electronic development. The increase amounted to about the present unit price for quantity production of one of the pieces of equipment resulting from that development.

Budgets, however, increased explosively after war started in Europe, and by the time it reached us on December 7, 1941, we had a limited number of detection equipment of two types in actual use. Since then, many new types of electronic equipment have been developed, some of it for purposes not even conceived before the war, based on research and inventions made since the war started. There are records of well over 500 inventions rising out of Signal Corps projects alone, which are of major importance because of broad scope or extensive production, without taking account of any whose value remains to be proved. The Navy has at least as many more types of electronic equipment in the same fields, and the contributions of our Allies and our own industrial laboratories cannot even be estimated until after the war is over and all records become available.

Although there have been spectacular developments in classified electronic items, this has not been at the expense of other components of signal communications equipment. Before the war we had radio communication equipment that seemed, if not entirely adequate, as good as was likely to be forthcoming. Today we are producing different types of radio sets for infantry, artillery and tank use, interplane and plane-to-ground, for parachute troops and amphibious forces,

MAJ. GEN. RUSH B. LINCOLN addresses the French people of New Caledonia. The occasion was the first anniversary of the arrival of American troops on the island. His speech was translated into French and re-read to the radio audience.

radiotelephone, telegraph and facsimile, mobile and fixed station frequency modulated and amplitude modulated. Only one of the radio sets now in production, however, is of prewar design. New tactics and an advancing art have demanded that the others be redesigned or developed from the ground up.

I spoke a moment ago of "extensive use," but we have given these words a new meaning. Our monthly receipts of radio equipment are half again as great as the yearly prewar output of the entire industry. For that equipment we are paying, monthly, as much as the entire cost of the Panama Canal. The fixed plant of the Signal Corps' radio system today greatly exceeds the total of such equipment in the world before the war.

Merely to produce such expansion of manufacture was a technological problem of heretofore unparalleled proportions. Research and development had to compete for manpower and materials with those who were undertaking greatly expanded production to new standards of tolerance. While we were having made, monthly, enough telephone wire to encircle the earth 10 times, we were confronted with the problem of learning to insulate it with synthetic, instead of natural, rubber. While expanding the production of quartz crystals 500-fold, we had to develop new types and learn how to keep them from aging.

I have said that "we" did these things. By that I do not mean the Signal Corps, but the team formed by the scientists and engineers in industry, the universities, the Navy, the National Defense Research Committee and the Office of Scientific Research and Development, and the Signal Corps. The role of the latter has been more and more merely to assign the problems for you and your confreres in civilian life to solve.

It is because of such mentioned accomplishments that I say the first phase has passed. Even if we wished to do so, we could not put the results of new research and development into production at the rate we have been doing in the past three years. The facilities, the materials and the manpower necessary do not exist.

Moreover, for the moment, we have solutions to most of our basic problems. Not all of them, of course. As yet, I cannot see through a mere six inches of earth to identify a nonmetallic anti-

One Word Describes It—QUALITY

ACORN INSULATED WIRE

ACORN INSULATED WIRE CO., INC., 225 KING STREET, BROOKLYN 31, N. Y.

LEICH SALES CORP., 427 W. Randolph St., Chicago • LINDSAY SUPPLY CO., 4815 Superior Ave., Cleveland

Drop Wire—Bridle—Interior—Tree—Ground—Switchboard—Pothead—Cable Terminal—Instrument—Fixture—Buried Wire

personnel, or antitank mine. If you would give me the means to do that, you would save untold lives; if you would go further and show me how safely to destroy the mines when detected, you would save thousands more, not only directly but by restoring to our troops the mobility that the mines now curtail.

If you would give me a dry cell that would operate at stratosphere temperatures without too great loss of power, or insulation for wire that would not become brittle at like temperatures, you would deserve the gratitude of a nation. Or give me a sound powered telephone with a talking range equal to the externally powered variety. These represent a few of the things that remain in the first phase of development; we have not *a* solution, much less *the* solution to problems such as these.

No contribution that could be made at the moment would be more welcome than a really satisfactory source of power. We are not proud of the fact that our small gas engines weigh 20 to 30 pounds per horsepower, as against four-tenths to six-tenths for aircraft engines. A small engine that would operate satisfactorily on leaded gas, or even a simple method of deleading gas, would help a lot. In all of our power sources, we need improvements beyond mere refinement; improvements in performance running to higher orders of magnitude. You have given such an improvement to us in dry cells for tropical use, but nowhere else in the power field that I can think of.

I might digress to point out here that an improvement in the order of magnitude in any line frequency has an impact that goes beyond its immediate field and affects almost all lines of endeavor. The radio relay has made a saving of that order in manpower for construction and maintenance which may mean that communications can be established where they were impossible before. The tropical dry cell gives us more shipping space and may mean an all-or-nothing difference in maintaining communication when the going is tough. New orders of magnitude in precision of dimension or of frequency stability have their effect in every field of science. Research and development growing out of this war have given such improvements in several fields.

Apparently, minor developments or improvements may create disproportionate and even spectacular results. For instance, before 1941 the smallest radio transmitter, the radiosonde, was highly uncertain in operation—nearly 90 per cent failed. The famous blond-

Underground communication dugout in New Guinea which contains a 12-drop switchboard. In the rear (left) is the tent that houses the power plant.

hair moisture unit was then discarded for a plastic device and a tiny ceramic resistor was developed to measure temperature. The resulting radiosonde (costing only $24 complete with balloon, parachute, temperature, moisture and pressure units) always worked, as military equipment must. The importance of this is illustrated by the record of an 80 mm. mortar, firing through overcast. A ground wind was blowing at 12 miles per hour. A radiosonde, however, showed that along the trajectory there was a 213-mile wind, which only a radiosonde could have detected. The incredulous artillerymen, reluctantly and under protest, made a correction of 4,000 yards (over 2¼ miles) in their firing data. Closing their eyes, they shudderingly and prayerfully jerked the lanyard and found, to their amazement, that the projectile landed on the target instead of on their own troops.

Returning to the present phase of our own program, the role of development is twofold: First, the improvement and refinement of present equipment, and second, the devising of countermeasures.

Improvement may mean many things, but increase in reliability comes first, and performance, increased range or accuracy, second. Simplification in manufacture or use is desirable to curtail materials, manpower and training time, but the importance of simplification can be over-emphasized. We now have manufacturers who know how to make, and troops who know how to use, equipment of high precision and complexity. It is less of a task to teach the manufacture and use of more complex equipment today than it was to teach the manufacture and use of relatively simple gear two years ago. Hence, if reliability or performance conflict with simplicity, it is simplicity that will be sacrificed.

I have already referred briefly to countermeasures. Our first approach is to combat the techniques we ourselves have developed on the theory that the enemy will use the same ones eventually, if not immediately. Our next step is to find means of combating the enemy's deviltries as fast as he produces new ones, and to concoct still newer deviltries of our own for use when he solves those we are now using.

In the present stage of our development program, both as to refinement and countermeasures, field experience is of utmost importance. That experience is gained in two ways. The first

(Please turn to page 78)

It's a job *for*

Photograph Courtesy Kellogg Switchboard & Supply Co., Chicago

CALCULAGRAPH

THE CALCULAGRAPH is helping in an important way to handle the record shattering volume of toll traffic.

For over a half century these instruments have been used in central offices to obtain the essential data on toll calls. An outstanding record for accuracy, time saving, and dependability, with simplicity of operation have achieved for Calculagraph a high position in the telephone field.

Timing of long distance calls is truly a Calculagraph job!

CALCULAGRAPH COMPANY

INCORPORATED 1892

310 SUSSEX STREET • HARRISON, NEW JERSEY

FIVE SOUND and LOGICAL REASONS

WHY *YOU* SHOULD CONSIDER THE USE OF

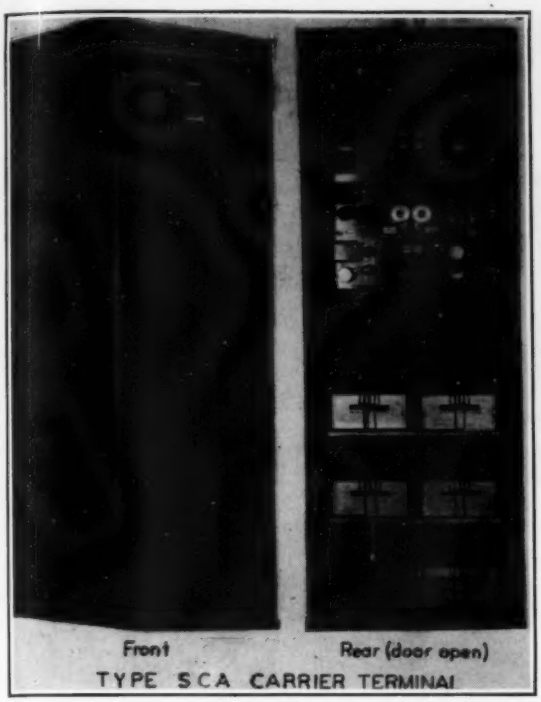
"*SETCO*" TELEPHONE AND TELEGRAPH CARRIER EQUIPMENT, VOICE REPEATERS AND OTHER "LONG-DISTANCE" COMMUNICATION EQUIPMENT, SPECIALTIES AND ACCESSORIES:

1. Pioneers of "A.C. operated" transmission equipment since 1927.
2. 15 years of national and international operations under every conceivable condition of service and climate.
3. "Package type" units which can be installed within a few hours by any average telephone man (Just "hook up and plug in").
4. Utmost flexibility of carrier application, including:
   (a) Fool-proof and trouble-free design.
   (b) "Terminal per channel" system permitting "dropping-off" or "forking" of multi-channel systems at different locations.
   (c) Simplified 20-cycle signal circuit which will also pass the $3\frac{1}{2}$ cycle pulses of railway selector systems.
   (d) Quick conversion from 2 to 4-wire drop termination.
   (e) Full automatic level control on carrier telegraph channels.
5. One year factory service guarantee.

WE ALSO PRODUCE

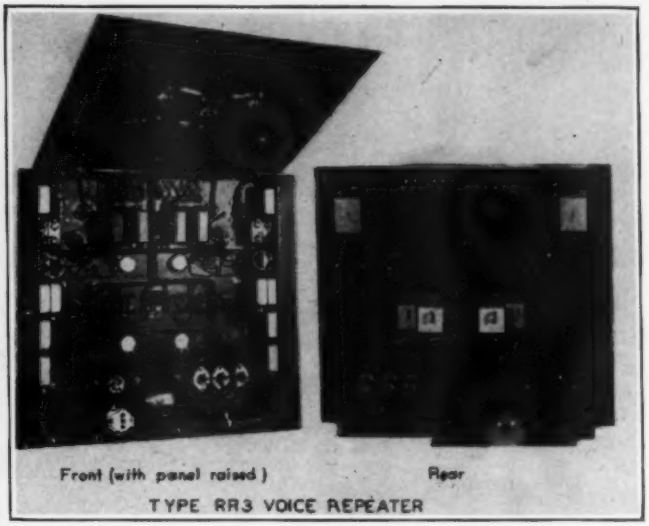
A complete line of accessories, including:

1. Transmission testing equipment.
2. Auto-transformers for impedence matching.
3. Intermediate line-filters, "side line" filters and pole junction filters, etc.
4. Insulating transformers (for "Hi-line" routes) which will withstand 25000 volt breakdown test and pass all frequencies from 20 cycles to 28 kilocycles.
5. Power supply rectifier units for telegraph battery, bridge current, V.M. testing circuits, etc., up to 175 volts *filtered D.C.*
6. "All-frequency" repeating coils (20 cycles to 28 kilocycles).
7. Complete line of small transformers for any telephone or electronic usage.



Front Rear (door open)

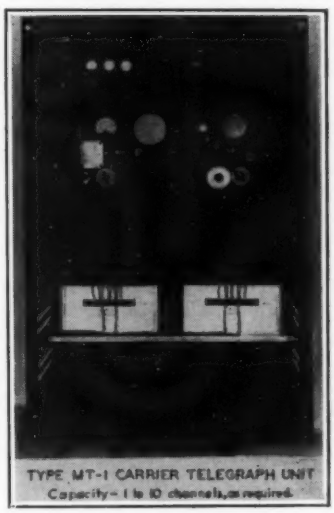
TYPE SCA CARRIER TERMINAL



Front (with panel raised) Rear

TYPE RR3 VOICE REPEATER

**"OUR RESPONSIBILITY *BEGINS*
(NOT ENDS)
WITH THE SALE"**



TYPE MT-1 CARRIER TELEGRAPH UNIT
Capacity—1 to 10 channels, as required

310C AUTOTRANSFORMER
(4 variable ratios)

200A REPEATING COIL
(20 to 28000 cycles)

STANDARD POWER SUPPLY UNIT (200 WATT)
Fits all types SETCO T&T Carrier Equipment
(Plug-Connected)

Send us your wire maps and our engineers will furnish recommendations without cost or obligation. Our 1945 catalog will soon be ready for distribution anywhere in the world. Write for it.

SOUTHERN ELECTRIC and TRANSMISSION CO.

MANUFACTURING COMMUNICATION ENGINEERS

3127 HOLMES STREET **DALLAS, TEXAS**

THE PLANT MAN'S NOTEBOOK

BY RAY BLAIN • TECHNICAL EDITOR

WE ARE informed that applications for Bell System telephone service being held, due to lack of facilities, had reached a total of 1,032,582 at the end of the first quarter of 1944. It is pointed out that this was 384,364 more than on January 1.

* * *

It has been said that good tools make good workmen. Inferior tools have likewise ruined an otherwise good job. A dull bit has marred the wood or plaster; a blunt screw driver has burred a screw head. These are only a few of the many evils in which inferior or improperly maintained tools can interfere with a quality job. It pays for telephone companies to purchase good tools and then make sure that they are used and maintained properly.

* * *

Background music furnished over a public address system is now being used successfully in many war plants as a means of releasing nervous tension, improving esprit de corps and providing a more pleasant atmosphere in which to work. Wheeler Beckett, music composer and conductor, is the author of a book entitled "Music in War Plants," written for the War Production Board in Washington, D. C.

The provision and maintenance of public address systems in manufacturing plants may become a profitable sideline for telephone companies in the postwar era.

* * *

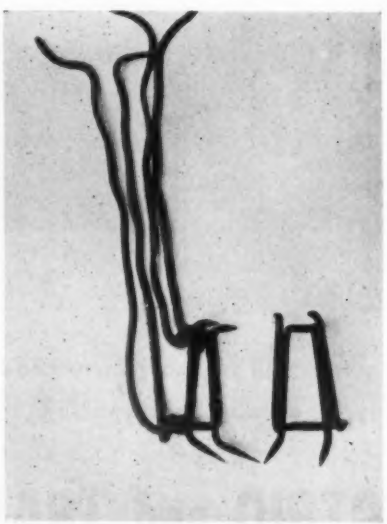
According to *Hello*, issued monthly by the Ohio Bell Telephone Co., salvaging of a long distance cable, built in 1913 between Hartford, Conn., and Providence, R. I., yielded nearly 3,000,000 pounds of critical metals, such as copper, lead and solder, to the nation's war supply. The salvage was possible because of advances in long distance telephony during the 30 years of the cable's existence. Five per cent as much copper as the old cable contained, today, can carry as many simultaneous conversations.

* * *

There are 58 varieties of termites in America. Last year they consumed $50,000,000 worth of property. Much of this damage was done to telephone property, which shows that it does not pay to use improperly treated timber.

* * *

The Japanese make use of the hooks shown in the accompanying photograph for climbing poles and trees. The raw-



hide thongs, which are used to lash the hooks to the feet, were removed from one climber before taking the photograph. This is submitted as just another indication that the Japs are not good communication men and that they will surely and completely lose this war.

* * *

According to the Philadelphia *Evening Bulletin* of August 10, Gen. Omar Bradley in France has a group of the best telephone construction engineers in the world which keeps his telephone communications in contact with his advancing forces whenever he moves ahead.

The major part of the group is from the New Jersey Bell Telephone Co., commanded by Lieut. Col. Royal Brooks, Sacramento, Calif. Colonel Brooks was formerly with the plant Engineering Agency stationed in Philadelphia, Pa.

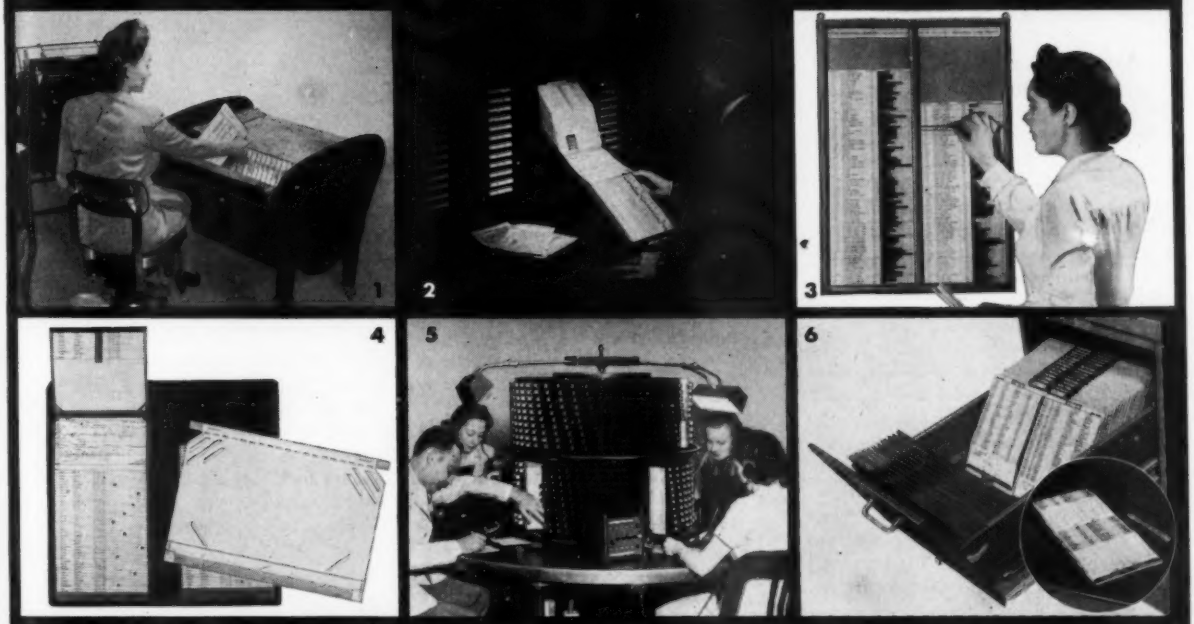
Since this group came in on D-day, it has laid more than 1,000 miles of wire. Its men have climbed poles and strung wire over hedges all the way from the first landing beach to wherever General Bradley has had his headquarters. The faster the corps moves forward, the faster their telephone lines must be lengthened. When the troops are slashing forward swiftly, the wires have to keep up with them.

* * *

Millions of letters are dictated into machines each day by busy executives, and later transcribed by stenographers. One large firm has more than 600 recording machines in as many offices. Squads of messengers go around each hour collecting the records and taking them to the typing pool. This practice means some 4,200 daily invasions of private offices by subordinates who cannot help interrupting the occupants.

Henry P. Clausen has just patented a system designed to eliminate this

There is an ACME VISIBLE RECORD SYSTEM *for every record requirement... and every one is a real* TIME-SAVER ...



Pictured above are but a few of the many types of Acme Systems equipment which have proven real time-savers to Government and Industry

Acme Visible Equipment is applicable to every kind of record and, when applied, *multiplies the value of the record* and, in addition, *effects a substantial saving in clerical time.*

Key men in government and industry require dependable facts, swiftly—accurately—and economically—because the advantageous use of all of our vital assets and the conservation of materials and effort are definitely dependent on proper records for co-ordination and control.

1 Acme VERI-VISIBLE equipment provides visualized control and speed—for *machine* posted—or hand posted records. Request booklet No. 519.

2 VISION cabinets, with protected record pockets, provide many ingenious arrangements—for multiplying the value of your records. Request booklet "VISION", No. 387.

3 Acme PRODUCTION CONTROL BOARDS with Flexoline strips, give you the essential facts, *at-a-glance*, so necessary for proper control. Booklet No. 417 contains helpful information on effective Production Control Systems.

4 ACME VISIBLE CARD BOOKS—Compact—Portable—Light Weight—Inexpensive. Won't scratch or mar desks. Ideal for the many important small records in your office. Ask for illustrated price list.

5 FLEXOLINE visible listing equipment—strips in panels—for every kind of index or reference record. Easy to keep up-to-date. For lists of a few hundred or many thousands. Ask for a Flexoline catalog.

6 Acme SUPER-VISIBLE, a visible card system with vertically filed panels—low in cost—high in efficiency and capacity. We will gladly submit recommendations.

ACME VISIBLE RECORDS, INC.

122 SOUTH MICHIGAN AVENUE • CHICAGO 3, ILLINOIS

nuisance and increase the load factor on recording machines to the theoretical limit. His plan provides for the dictation of all letters, over a telephone, to a central office where they are recorded on a new type machine and then given to the typing pool. According to Mr. Clausen, it would be possible for the above mentioned firm to reduce its recording machines from 600 to 60 by working this smaller number of machines practically all the time.

This central office system is separate from the ordinary telephone exchange, having its own switchboard and operator. When an executive wants to dictate, he simply picks up a special handset and waits. The operator selects a line connected with an idle recording unit and completes the connection. The completed connection is signaled back by means of a green light on the handset and the speaker proceeds with his dictation. Hanging up the instrument indicates on the switchboard that the dictator has finished; the operator then disconnects. A ticketing system insures that records made will be identified with their originating office.

* * *

The Glen L. Martin Co., airplane manufacturers, has developed a machine for printing numerals on half-inch transparent cellulose tape. Sections of this numbered tape are used for proper identification of the hundreds of wires and tubes going into a modern airplane. It is probable that a similar arrangement could be used for tagging cable and wires in the telephone industry. This method should prove more desirable than the one generally used, that is, attaching a small paper tag with a string.

* * *

In this column of July 22, we spoke of the need of an automatic talking clock for use in telephone exchanges that would automatically give the correct time. Mr. Aberg, of the Ericsson Telephone Sales Corp. in New York City, writes that his company has been manufacturing such a device for about 10 years and that a great number of them have been installed in many parts of the world. The standard machine, it is claimed, will take care of about 150 simultaneous calls and has proved extremely accurate. Usually, two machines are installed in parallel so if one fails there is another to automatically fill in.

This machine is of the photo-electric type and based on the well-known principal of talking pictures. The film, carrying the sound tract, is a circular disc that rotates around a shaft. The film is traversed by a ray of light which impinges on a photo-electric cell. The film discs have several concentric record bands. Each hour disc has 12, and each minute disc has 20, containing digits. The indication of the time is divided into separate parts for hours, minutes and if wanted, seconds, which are combined in succession to complete a time indication. The hours, minutes and seconds are recorded on separate film discs, and the time is indicated every 10 seconds. An indication may consequently be: "Eight; 36; 40." A machine to sound hours and minutes, but not seconds, is also available.

STOCK CONTROL LIAISON CHIEF

COL. W. P. PENCE

Col. William P. Pence, Chief of Liaison Branch, Stock Control Division, Headquarters, Army Service Forces, was born March 19, 1904, at Ft. Monroe, Va. He graduated from the U. S. Military Academy with a bachelor of science degree, and was commissioned a second lieutenant in the Signal Corps in June, 1927. He was promoted to first lieutenant in January, 1933; to captain, June, 1937; to major (temporary), January, 1944; to lieutenant colonel (temporary), February, 1942, and to colonel (temporary), March, 1944.

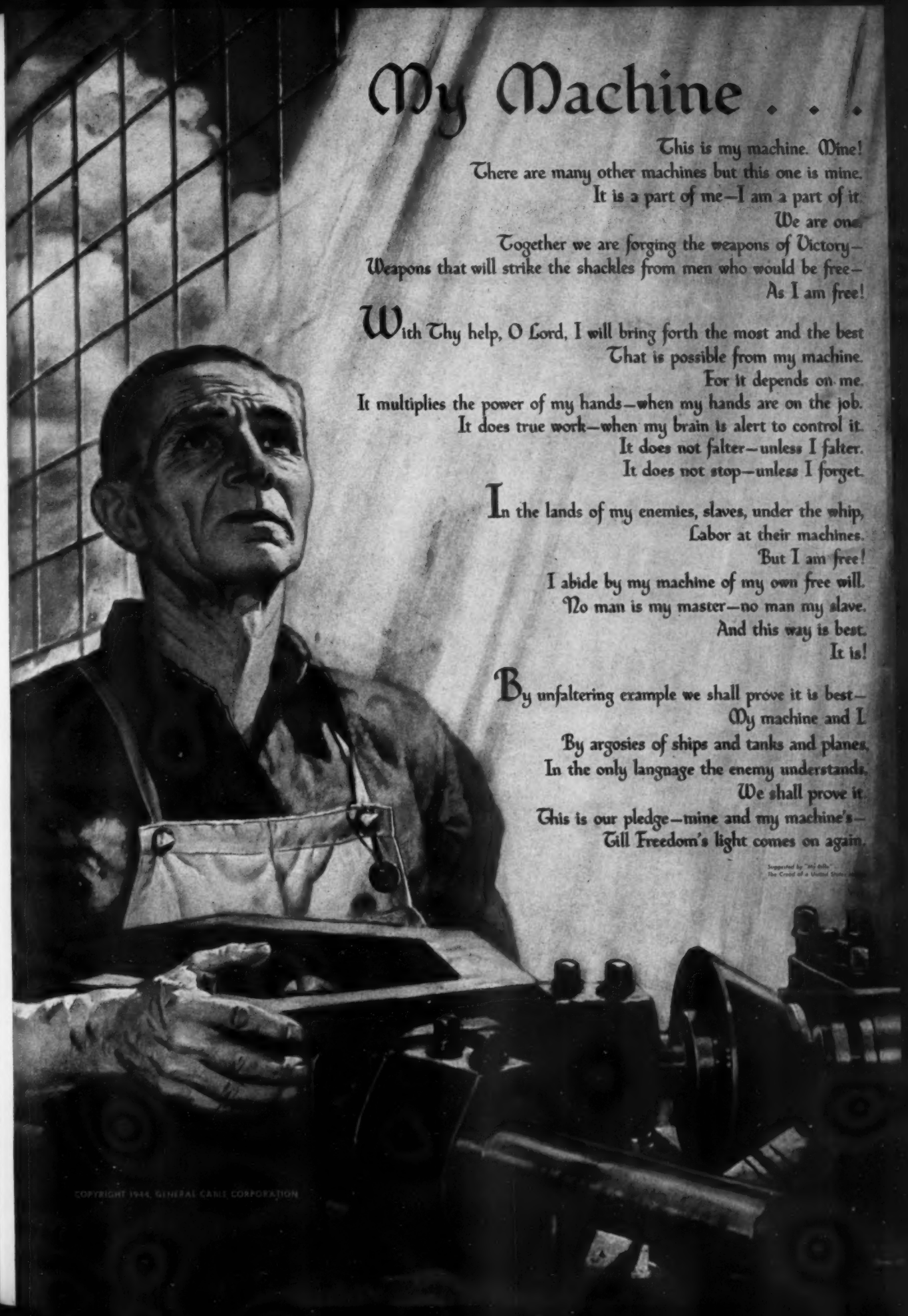
After graduating from the Signal communication course at Scheffield Scientific School, Yale University in June, 1928, he was assigned to the 51st Signal Battalion at Ft. Monmouth, N. J., and the following September was assigned to the Signal School from which he graduated in June, 1929.

He was next assigned to Schofield Barracks, Hawaii, where he was appointed post supply officer in September, 1930. Returning to the United States in August, 1931, he was assigned as a student officer at the New Jersey Bell Telephone Co. plant school in Newark, N. J. He completed this course in June, 1932, and was ordered to duty in the plant and traffic division, Office Chief Signal Officer, Washington, D. C. In October, 1932, he became assistant to the signal officer, Headquarters Ninth Corps Area, Presidio of San Francisco, Calif., where he served until July, 1934.

He then returned to Washington, D. C., and was placed in charge of the telephone section, plant and traffic division, Office Chief Signal Officer. In June, 1938, he was ordered to Panama, where he served as assistant department signal officer. Upon his return to this country in July, 1940, he was designated officer in charge of the wire division, enlisted men's department, Ft. Monmouth. The following December he was transferred to Ft. Jackson, S. C., where he assumed command of the Eighth Signal company.

Later, he became assistant to the Eighth division signal officer at the same post. From March until June, 1941, he served as signal officer, Eighth division; later being assigned to Ft. Devens, Mass., as signal officer, Caribbean force. In September, 1942, he went to Washington, D. C., as officer in charge, publications and training division, Office of the Chief Signal Officer.

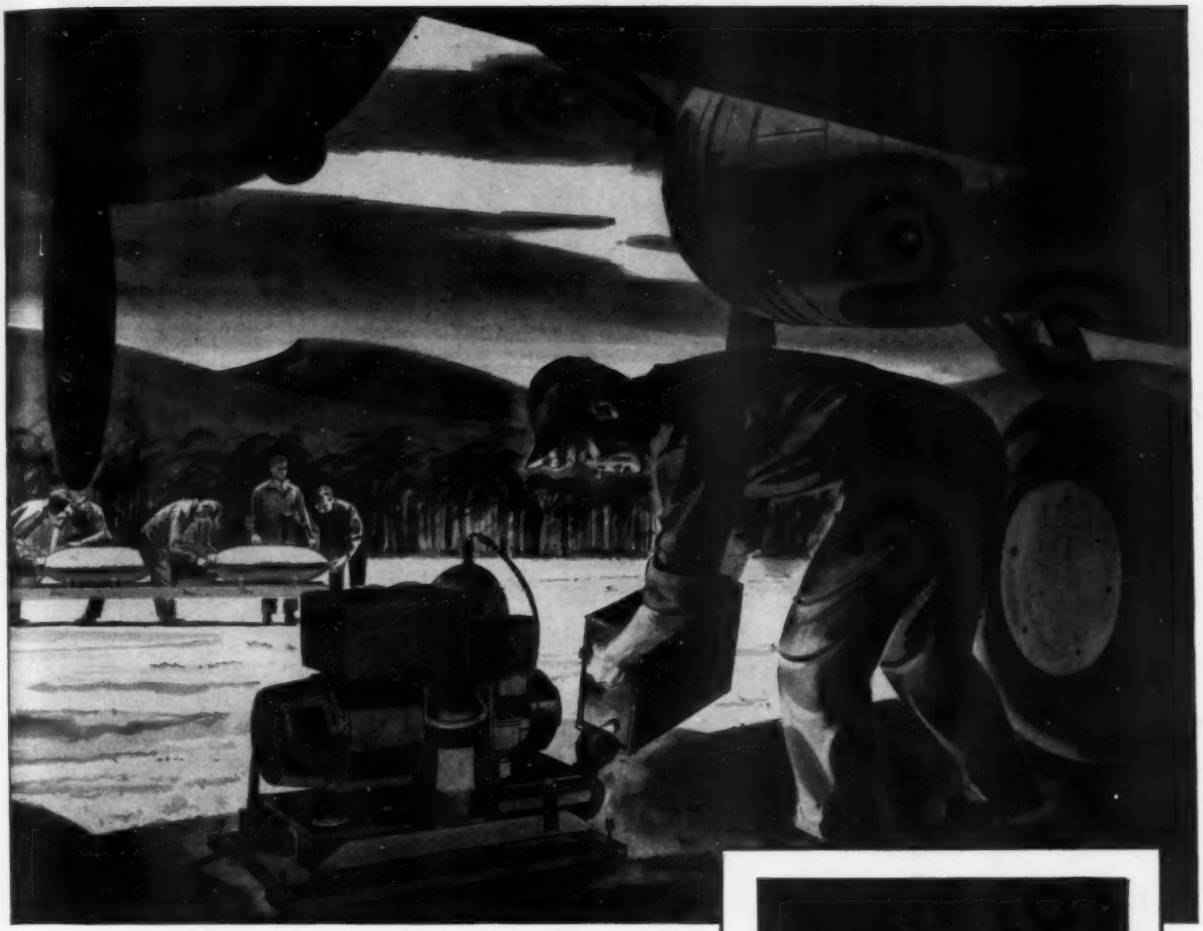
From January until March, 1942, he was on duty in the supply division, War Department General Staff, G-4, and then was assigned to the procurement and distribution division, headquarters services of supply, now known as the Army Service Forces. He was named chief of the miscellaneous issue branch, stock control division, headquarters, Army Service Forces, in January, 1943, and the following December he became chief of the liaison branch in the same division.


My Machine . . .
This is my machine. Mine!
There are many other machines but this one is mine.
It is a part of me—I am a part of it.
We are one.
Together we are forging the weapons of Victory—
Weapons that will strike the shackles from men who would be free—
As I am free!
With Thy help, O Lord, I will bring forth the most and the best
That is possible from my machine.
For it depends on me.
It multiplies the power of my hands—when my hands are on the job.
It does true work—when my brain is alert to control it.
It does not falter—unless I falter.
It does not stop—unless I forget.
In the lands of my enemies, slaves, under the whip,
Labor at their machines.
But I am free!
I abide by my machine of my own free will.
No man is my master—no man my slave.
And this way is best.
It is!
By unfaltering example we shall prove it is best—
My machine and I
By argosies of ships and tanks and planes,
In the only language the enemy understands,
We shall prove it.
This is our pledge—mine and my machine's—
Till Freedom's light comes on again.
COPYRIGHT 1944, GENERAL CABLE CORPORATION

This war poster, the eighth of a series, is published as a tribute to the men and women in war plants from coast to coast who inspired the message.

GENERAL CABLE CORPORATION

If engaged in war work: larger bulletin board copies (25 x 35 inches) are available with our compliments. Write GENERAL CABLE CORPORATION, 420 Lexington Avenue, New York 17, N. Y.



It eats the same grub as planes

And likes it! . . . Yes, a Homelite Portable Generator can be operated on high octane, highly leaded aviation gasoline. No special diet is necessary . . . even 100 octane gas, the fuel of planes, can't harm a Homelite's built-in gasoline engine.

The simple reason is this . . . the Homelite *two-cycle* engine has no exhaust valves to burn out. That's right . . . no valves to foul with lead or carbon . . . no valve seats to reface. Its only valve is a simple rotary valve that governs the flow of fuel.

This, plus automatic voltage regulation, a lubrication system that supplies fresh, clean oil at each revolution, are some of the many reasons why thousands of rugged Homelite Portable Gasoline-engine-driven Generators are working in and around our military planes everywhere.

A Homelite Portable Generator isn't too fussy how you treat it or how you use it. Just give it some gasoline with a proper mixture of oil and it will work all day and night. It will work in rain, snow, sleet or heat and furnish all the electric power you need for operating powerful, flickerless floodlights or handy electric tools.

HOMELITE CORPORATION

PORT CHESTER, NEW YORK

From THEN 1904 till NOW - 1944 !

BUY WAR BONDS

FORTY YEARS OF *Unexcelled Service*

In 1904, when CHURCHILL CABINET COMPANY began, its first order was for wall boxes for the telephone industry. Today, after 40 years of uninterrupted production, "CHURCHILL WOOD PRODUCTS" are serving the communication field with the highest quality wood products.

In this its 40th anniversary year, CHURCHILL CABINET COMPANY salutes the telephone industry, not only for the tremendous job it has done in establishing a vital wartime communications system, but also for maintaining the magnificent civilian telephone system in these days of extended wartime demand.

As soon as manufacturing conditions permit, CHURCHILL CABINET COMPANY will furnish highest quality wood products with the fine workmanship and materials to which its customers have long been accustomed.

Churchill Booths Are Distributed By:

Automatic Electric Sales Corp. — Stromberg-Carlson Company
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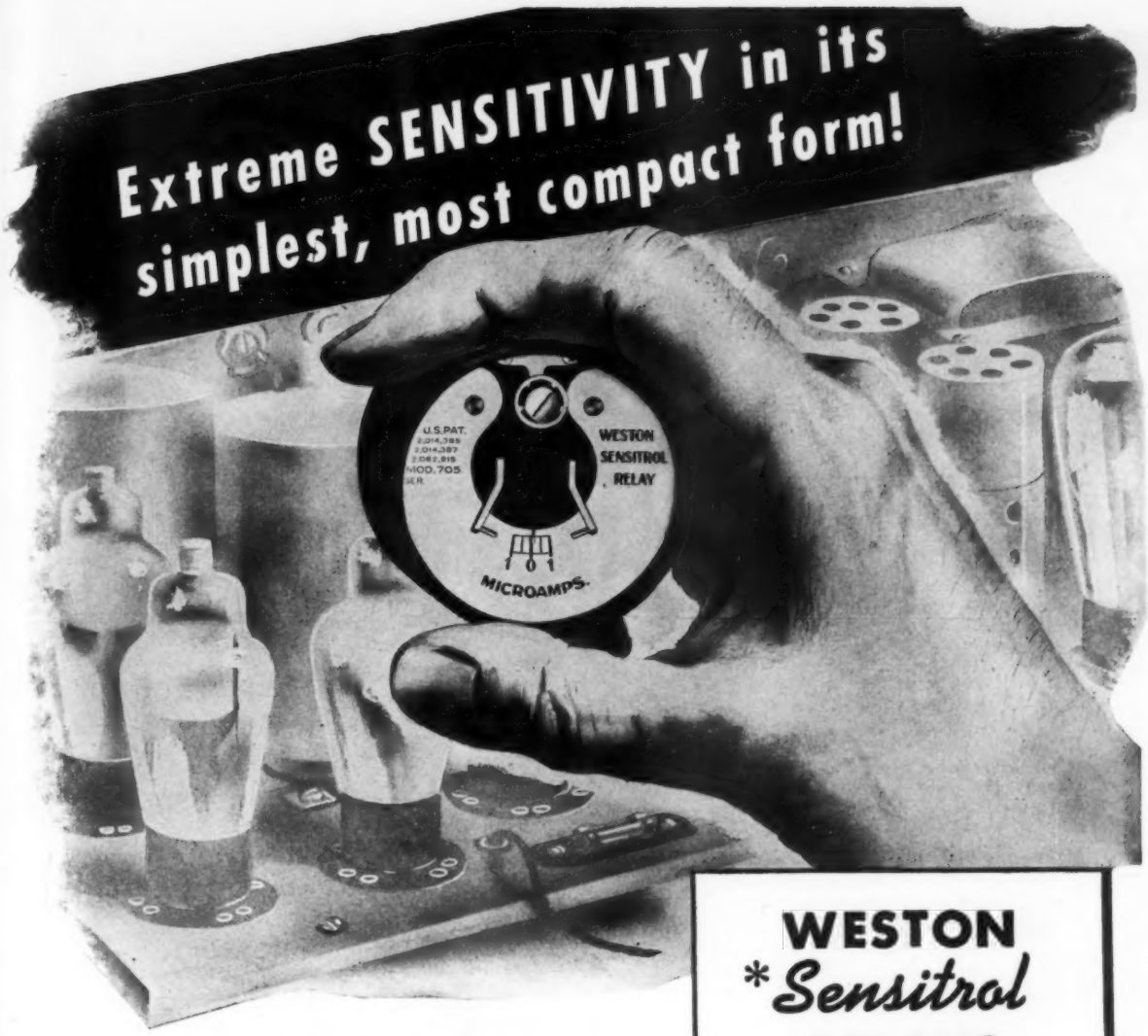
Kellogg Switchboard and Supply Co.

CHURCHILL CABINET COMPANY
2119 CHURCHILL STREET · CHICAGO 47, ILLINOIS

Extreme SENSITIVITY in its simplest, most compact form!



Before costly and intricate amplification is included in tomorrow's circuits, check the SENSITROL and other WESTON Sensitive relays. More than likely, you'll find amplification unnecessary . . . that a tiny Sensitrol relay will give you the positive control you seek. For SENSITROL Relays, which in pre-war days controlled at values low as 2 microamperes, now provide positive control at input values of a *far lower order.* This extreme sensitivity, plus the other virtues of the Sensitrol such as its cost and weight saving, and its trouble-free operation, may be just the thing to round-out or make entirely practical the device or circuit you have in mind.

Why not obtain all the facts on "what's ahead" in sensitive relays and indicating instruments by contacting WESTON today. Check with them, too, for all war instrument requirements.

WESTON
Sensitrol
RELAYS

in pre-war days provided positive control at energy levels low as 2 microamperes . . . today are many, many times more sensitive!

**Sensitrol — A registered trade-mark designating the contact-making instruments and relays, the contacts of which are magnetic, as manufactured exclusively by the Weston Electrical Instrument Corporation.*

Laboratory Standards . . . Precision DC and AC Portables . . . Instrument Transformers . . . Sensitive Relays . . . DC, AC, and Thermo Switchboard and Panel Instruments.

WESTON

Specialized Test Equipment . . . Light Measurement and Control Devices . . . Exposure Meters...Aircraft Instruments... Electric Tachometers...Dial Thermometers.

Weston Electrical Instrument Corporation, 576 Frelinghuysen Avenue, Newark 5, N. J.

STAY SAFE
OFF-THE-JOB, TOO
I GOT TO HAVE THIS NICE AND CLEAN FOR MY DATE WITH PETE TONIGHT
SHE MUST MEAN ST. PETER!
GASOLINE
NATIONAL SAFETY COUNCIL

HOME HAZARDS

The hazards of the home are these;
A knife with sharp edge pointed out,
Small obstacles that no one sees.
The toys the children leave about;
A piece of soap on floor and stair,
Torn rugs which trip unwary feet.
The home, statistics all declare,
Is far more dangerous than the street.

Against the hazards when we roam,
Are signs which warn us to beware.
But all turn careless, when at home,
By thinking surely safety's there.
Through spaces dark we boldly go
Disaster swift and dire to meet,
Though this, by now, we ought to know:
The home's more dangerous than the street.

The hazards of the road we fear.
The hazards of the home we scorn.
We're careful when the signs are clear
But heedless when there's none to warn.
We've marked the curves where danger waits
Lest proper caution be forgot,
But once within the family gates
At home we're all a careless lot.

The verses above were written by Edgar A. Guest at the suggestion of the National Safety Council and appeared in Mr. Guest's sydnicated column in newspapers throughout the country.

STAY SAFE
OFF-THE-JOB, TOO
YOU WANT FIRST AID FOR THAT LITTLE SCRATCH?
YOU'RE DERN TOOTIN! I'VE LEARNED AT THE SHOP THAT A LITTLE CUT IS A BIG OPPORTUNITY FOR A BLOOD POISON BUG!
NATIONAL SAFETY COUNCIL

"No Experience Necessary"

That's a phrase we're borrowing from the "Help Wanted" columns, for it certainly applies to Bethlehem's new serving tool . . . a tool so easy to use that any lineman can learn to handle it in a few minutes' time.

As the illustration shows, the device makes possible a neat, tremendously strong serve by means of the dead-end coil method. Using a 10-foot coil of 11-gage bethanized dead-end wire, the lineman hooks one end in place on the strand; then, engaging the wire between the fingers of the serving tool, he wraps it solidly in place with a simple rotary motion. Exhaustive tests have proved conclusively that the serve holds beyond the useful strength of the strand.

After a little practice, the lineman can make his serve in about the time required to attach conventional clamps. Besides, this serve is considerably more economical than the clamp method, for a coil of the necessary wire costs less than even a single inexpensive clamp.

The serving-tool technique is especially recommended for use with *bethanized* strand and wire—manufactured by Bethlehem Steel Company. One reason is that the highly ductile, uniform bethanized coating (almost 100 per cent pure zinc, applied electrolytically) is not displaced to any harmful extent by the operation of the serving tool. Moreover, when bethanized strand and dead-end wire are used, there is no question about the holding power of the serve.

Write for more details—or, better still, ask the nearest Bethlehem representative to explain this simple, effective technique.

★ ★ BETHLEHEM STEEL ★ ★

The three photographs on this page show Signal Corps men employing the aid of elephants in repairing Army communication lines. UPPER LEFT, S/SGT. M. MALLORY, Windham, N. Y., and CORP. M. JAKUBOWSKI, Brooklyn, N. Y., on the elephant, which is dragging a broken pole. UPPER RIGHT, an elephant, her young by her side, carrying supplies.

British Council Discusses Empire Communications

Following the recent visit of Dominion Prime Ministers to Great Britain when the Commonwealth Communications Council also convened, preliminary discussions were held on the subject of Empire communications.

It is now reported that the council has submitted proposals to the United Kingdom, the Dominions and Indian governments regarding the reorganization of Empire telecommunications. The establishment of public utility corporations separately owned by the country concerned, but interlinked with the corresponding units in other participating countries, has been proposed.

V V

Increased Telephone Traffic

During the first three months of 1944, the number of long distance telephone calls was 25 per cent greater than the number handled in the same period last year.

V V

Telephone Transfers Drop

There will be approximately 4,000 less telephones transferred during the fall moving period of this year than a year ago, according to a recent statement by the New York Telephone Co.

(Signal Corps Photos)

SERGEANT MALLORY and CORPORAL JAKUBOWSKI use an elephant to good advantage in checking a splice. These pictures were made in the China-Burma-India theater of operations.

For
CABLE SPLICING
We Suggest
DRIERITE DESICCANT

DRIERITE DESICCANT absorbs water by Chemical Action and its performance is not limited to absorbing moisture "by physical means alone."

DRIERITE DESICCANT maintains the extremely dry condition corresponding to the dew-point of minus 110° F. This high drying efficiency cannot be obtained by a substance which absorbs moisture "by physical means alone."

DRIERITE DESICCANT absorbs and holds moisture notwithstanding temperature rise; physical absorbents release absorbed moisture if the temperature of the splice is raised.

DRIERITE DESICCANT is the most efficient drying agent available for cable splicing; and is furnished to all users under our established price schedule.

STANDARD PACKAGES

1/8 Pint Can (50 grams) 48 per Carton
1/2 Pint Can (200 grams) 12 per Carton
1 Quart Can (800 grams) 12 per Carton

W. A. HAMMOND
DRIERITE COMPANY
XENIA, OHIO

HEXACON
is helping to do the job at
Westinghouse

TYPE P-200 for quick, ample heat and long life

One of the major suppliers to the Armed Forces in wartime, and to civilian requirements in peacetime, Westinghouse has consistently specified HEXACON soldering irons for continuous productions needs.

"BALANCED HEAT"

Incorporating the exclusive new HEXACON principle of design, excessive element-impairing heat is dissipated by the patented hexagon-shaped barrel. Dangers through over-heating (premature element burnouts and excess tip wear) is minimized, and efficiency and economy of operation are increased.

The HEXACON line is one of the most complete lines available today, and includes 25 sizes of Screw and Plug Tip types, as well as the patented Hatchet type iron. 40 to 700 watts; ¼" to 1¾" tip diameters. Approved by Underwriter's Laboratories. Write for illustrated literature.

HEXACON ELECTRIC CO.
137 WEST CLAY AVE., ROSELLE PARK, N. J.

HEXACON

New Traffic Employes

By EDNA GOODWIN
Bloomington, Ill.
Chief Operator, Wabash Telephone Co.

A FEW months ago while talking with Mrs. Mayme Workman [Traffic Editor of TELEPHONY and Traffic Supervisor of the Illinois Telephone Association], I was enthusiastically telling her about the splendid work being performed by some of our very new operators. Much has been said and written about why senior telephone employes are staying on at their jobs. Shouldn't credit also be given to the newer employes who, although they are just getting a start, are also staying on their jobs?

These articles and comments by senior employes have given us all something to think about. The comments are very timely. Some of the articles which have appeared in TELEPHONY have been posted on our bulletin board, as I feel that too much emphasis cannot be placed on the importance and responsibility of a telephone employe.

EDNA GOODWIN

We do not start to work with this feeling, but acquire it as we become more familiar with what is expected of us. It is true, of course, that most of us have selected our work because we thought we would like it and would find it interesting, but we have had to learn just how important our jobs really are.

Most of us, if we entered service prior to say, three years ago, received thorough training and had an opportunity to develop as we went along. But our new employes are starting their careers at a time when their services are urgently needed, so that, due to these circumstances, they are pressed into service to replace older experienced operators, in some instances, without having received as much training as is basically needed and before they are ready to assume the duties imposed upon them. This condition does not necessarily reflect on the ones in charge who are responsible for the initial training of new personnel as the demand for trained

QUALITY HOISTS

For every telephone construction and maintenance job there is a proper Coffing hoist. Whether it be pulling up cables, tightening guy wires or truck maintenance in the garage there is a Coffing Hoist that will do that lifting or pulling job easily, quickly and economically.

In your post-war plans don't forget to include a "Safety-Pull" ratchet lever hoist for every truck.

WRITE TODAY FOR CATALOG TG-6

UTILITY MAINTENANCE TOOLS — RATCHET LEVER HOISTS
SPUR GEAR HOISTS — ELECTRIC HOISTS

COFFING HOIST COMPANY
Danville, Illinois, U. S. A.

Never Miss a "Good Bet"

AT THE U.S.I.T.A. CONVENTION OCT. 10-11-12

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CALL AT OUR ROOMS FOR YOUR COPY OF THE U.S.I.T.A. REPORT ON SPUN CABLE. —AND OTHER LATEST INFORMATION ON NEALE TOOLS

CABLE SPINNING EQUIPMENT CO.

TOPEKA, KANSAS

Pineapples—and Telephone Poles

Overhead construction and wiring leading to an underground telephone hut in the Hawaiian Islands. Photo by U. S. Army Signal Corps.

HERE, IN A HAWAIIAN pineapple field, are pressure-creosoted telephone poles, set up by the U. S. Army Signal Corps. Grown and processed in the United States, these poles are depended upon to serve for years, withstanding the attacks of termites which would devour native poles in a few months.

For many months, the Signal Corps has had first call on Taylor-Colquitt production. But we look forward to the day when we shall again be able to make prompt shipments to meet *your* needs.

Products distributed to Independent Telephone Companies by AUTOMATIC ELECTRIC SALES CORPORATION, 1033 W. Van Buren St., Chicago 7, Illinois.

TAYLOR-COLQUITT CO.

SPARTANBURG, S. C.

PLANTS AT

SPARTANBURG, S. C. AND WILMINGTON, N. C.

operators to fill vacancies greatly exceeds the supply.

In the past, we could anticipate vacancies and needed additions, but such is not the case today. A certain percentage of resignations occurring now are not known to us until a few days—and sometimes only one day—before an employe wishes to resign. In the past, the loss of one trained operator was deplored, even though she was but one of many experienced operators. Now, if we lose one employe whom we sometimes are not able to replace for a few days, our problem is indeed a serious one.

Some new employes are apt to become discouraged because too much is expected of them. Are we doing all we can to make things easier for these new people? We don't want to lose them, for if we have to replace them, time spent on their training is wasted and we don't know how new students will develop.

Prior to the present emergency, a new employe was a rarity indeed in most offices, especially in those offices whose personnel were retained after marriage. When a new student was receiving her initial training, every effort was made to impress her with the importance of her position and she was shown every consideration.

Now that we are experiencing an unheard of, and hitherto undreamed of, turnover, we have had to shorten our training period and, even with this reduction in the training, we have had to expect more from the students than in the past. We have had an increase in traffic; our positions are no less heavily loaded, and yet we are trying to maintain our former standards of service. Formerly we allowed several weeks for

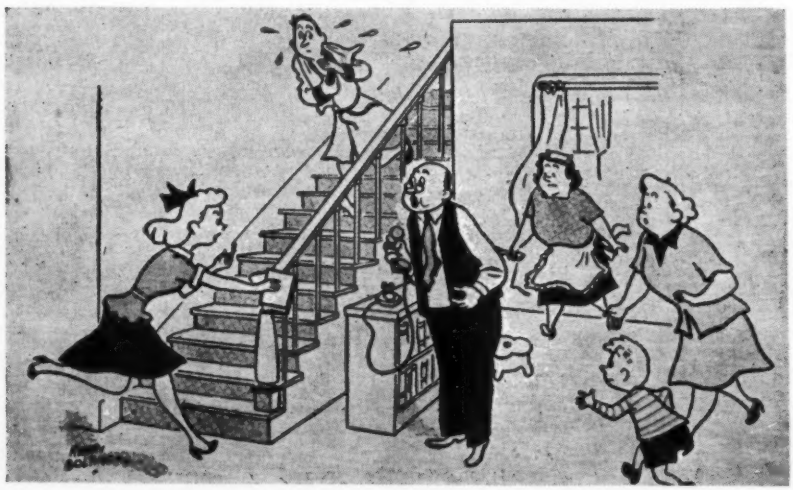
a student to receive her initial training. Even after that, we still gave her most of our attention. We were sometimes glad of a new personality as we knew so well what to expect of our senior employes.

At our office I interview new applicants and in so doing have always tried to select those who really seem to be particularly interested in careers as telephone workers. If they were looking only for temporary employment, I pointed out to them that we like to feel that an employe will be with us a reasonable length of time. Now with a decrease in the number of applications received, we are glad to consider any likely-appearing prospect. I was asked by our general manager, R. B. Still, a short time ago how I selected applicants now. I told him that I do not select them, I just take them. I was not being flippant, as this is literally true in some cases and that is why I am so impressed with the way some are developing.

In my department — the local department—we have approximately 90 employes. This includes supervisors, night operators, information operators, clerks, chief operators, and an instructress. Of this total, 65 are "A" and "B" operators. Since January 1 of this year, out of this total of 65, we have had 34 resignations. Our losses over the past two years have averaged about the same, and in some months, the number is greater.

It is, therefore, gratifying to know that the new employes are doing a good job. I do not mean to convey the impression that all these new employes have proved satisfactory. In some I have been disappointed; a very few we did not retain. We have had some compliments on our service and we have had complaints. However, the criticisms seem to be well meant. I think subscribers as a whole are being very considerate.

Telephone service is not as good as it was, but much of the poor service could be charged to the subscribers. Even with advertising calling attention to limiting of conversations, we still continue to have tie-ups of positions



". . . wrong number!"

(Courtesy, Saturday Evening Post)

THE SET THAT *never slept*

10,800 Continuous Hours

Fifteen months of continual service, 10,800 continuous hours, night and day with the switch never once turned off—and no repairs or replacements needed. That's the record established by a Hallicrafters SX-28 in use testing crystal standards at Scientific Radio Products Co., Council Bluffs, Iowa.

Equal to Five Years' Use

Witness to this amazing performance was Myron C. Jones, resident inspector in charge. Day after day he watched "the set that never slept" in continuous action between January 5, 1943 and April 10, 1944.

Inspector Jones Writes:

"This is what I call punishment. It surpasses five years of ordinary use, with no new parts needed. This war plant had many more Hallicrafters receivers, all performing outstandingly. You can't beat Hallicrafters for endurance, sensitivity, selectivity, tone, ease of operation and all around performance."

"The Radio Man's Radio"

This is only one more significant notch in Hallicrafters' record. Men who know radios inside out, men who depend on them when life itself is at stake and when there can be no compromise with quality, specify Hallicrafters, "the radio man's radio."

BUY A WAR BOND TODAY

hallicrafters RADIO

THE HALLICRAFTERS CO., MANUFACTURERS OF RADIO AND ELECTRONIC EQUIPMENT • CHICAGO 16, U. S. A.

"The Greatest Advancement in Earth Drills"

The patented K-M Drill is not an old fashioned Auger but a modern drill in keeping with present day needs for speed and efficiency.

★ ★ ★

Ka-Mo Tools, Inc. are builders of the most economical Earth Drills. It is hard to mention the type of application which these drills do NOT serve. This portable Earth Drill has been developed for various portable applications such as construction work—telephone poles—anchor holes—telegraph lines—R.E.A. lines—locating water and gas leaks in streets—drilling sump pumps—fencing testing soil—testing earth for foundations such as bridges—drilling for piling—feeding trees—drilling for bushes—foundations for head stones—emergency repair work for utilities and municipalities—railroads and many others.

K-M drills can be operated both by electric and air. The electric type can be carried in the trunk of your car, or take up only a small space in your truck. They can be carried as far away from the source of power as the length of the line will permit. This feature makes it possible to bore holes in many places that are inaccessible to other types of machines.

Whatever your portable job may be—KA-MO TOOLS, INC. can help you.

"DRILL IN OPERATION"

Letters Tell of Drills' Efficiency

One telephone company writes us that its cost was cut 70% in 60 miles of poles. Another company writes us: "this is the sweetest thing that ever came out". He drilled and set 240 poles in 30 hours using 6 men and a foreman. Other companies find this equipment pays for itself in two months. These statements can be proven by KA-MO TOOLS, INC.

Generators Useful Many Ways

The Generators can be used in many applications other than with drills such as: stand by when power lines fail—with flood lights for repair work while drilling—drilling your pole holes and anchor poles. Screw anchors can be run into the earth with our adapter and electric motor saving time and labor.

For details and illustrated literature write to

KA-MO TOOLS, Inc.

5525 WEST OHIO STREET **CHICAGO 44, ILLINOIS**

due to lengthy holding time. I sometimes wonder if during busy periods of the day, it wouldn't be advisable to ask subscribers to limit their local calls to five minutes. Of course, it would not be possible to keep a check on all connections, but it might help to relieve, to a certain extent, tie-ups of positions.

Our supervisors are doing a splendid job. An instructress has to depend a great deal on assistance from them to take over, after a few days, the continuation of instruction. This perhaps is not an ideal arrangement insofar as the student is concerned. Perhaps it would be better for her to receive all her instruction from someone in whom she has begun to feel confidence. We seem to be making progress, however, and may learn something new from this necessary readjustment. We have simplified our instructions as much as we think possible, but we may be able to find other ways of making the learning of the work easier for the new students.

Do we appreciate the sincere efforts of these new employes who are trying to learn to be good operators at this time? They must really want to work for us for, as we all know, telephone companies have a great deal of competition from other industries at this time. We must do all we can to make these newcomers who are just entering service feel that they have really selected the right career. We know they have, because long after this present crisis is over, there will still be a demand for telephone workers. People always want to talk.

Our new people in the traffic department are greatly impressed with the so-called older people whose applications we probably would not have considered prior to the present emergency. They are doing a fine job. Their attendance record is good and it should be an inspiration to some of the younger employes.

In closing, I would like to summarize those things which we have all known to be of importance, but which seem to be more essential at this time, to help the new employes, and also the senior employes:

(1) Select applicants as carefully as possible.

(2) Simplify instructions so that learning will be made easier.

(3) Increase supervision both for the benefit of the service as well as to help the student.

(4) Be more tactful than ever in corrections.

(5) Bestow praise instead of criticism whenever possible.

[EDITOR'S NOTE: *This paper was presented by Miss Goodwin before the traffic meeting of the recent convention of the Illinois Telephone Association.*]

V V

U. S. Device Helped to Halt German Robots

The M-9 electrical director for 90 mm. anti-aircraft guns, developed by Bell Telephone Laboratories, has been used successfully in putting an end to the German robot flying bomb ravages on England, it was disclosed recently by Dr. Clarence A. Lovell of the Bell Laboratories, one of the inventors of the M-9 director.

The device, operated by two men, virtually automatically calculates the height and speed of the approaching target and sets the anti-aircraft shell fuse to explode precisely where it will prove most effective.

V V

Completes 40 Years' Service

PHILIP C. STAPLES, president, Bell phone Co. of Pennsylvania, recently completed 40 years in the telephone business. Like other Bell System executives, he started at the bottom, beginning as a $12-a-week telephone salesman, on September 5, 1904. He has headed the Pennsylvania company for the last 11 years.

HOLTZER-CABOT

4-FREQUENCY MOTOR GENERATORS

Provide dependable power for Ringing Party Lines

Whether it be during war or peace, telephone ringing equipment must be efficient and dependable at all times.

Holtzer-Cabot 4-Frequency Motor Generators meet telephone performance requirements under all operating conditions. Designed and developed especially for harmonic party line installations, they require minimum attention at the exchange and at the subscriber's telephone. Because they have no moving conductors . . . brushes . . . or collector rings, Holtzer-Cabot 4-Frequency Motor Generators provide continuous, efficient service year after year with minimum maintenance. They can be furnished with A.C. or D.C. motor drive . . . and equipped with tone and machine ringing interrupters. Output of this machine is 25 watts.

Like all Holtzer-Cabot ringing equipment, the 4-frequency motor generator has the unqualified approval of the engineering and service departments of all major telephone companies.

Let Holtzer-Cabot Engineers help you solve your ringing problems. Write for Bulletin 1310-02.

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Designers and Builders of Special Fractional HP Motors and Electrical Apparatus

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OUR 40TH ANNIVERSARY

Rounds out 40 years of building quality Cords, Wires and Cables and a realization of our ambition to make the best product possible.

Answering the call to fulfill today's severest problems paves the way to serve you with better products tomorrow.

Sturdy tinsel conductors having moisture-proof insulation finished with extra strong outer braid produces a Receiver Cord of longer life combined with trouble-free service. Write today for your copy of the LENZ Cord Chart listing all types of Cords for your convenience.

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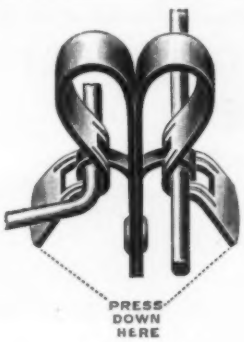
1751 N. WESTERN AVE., CHICAGO 47, ILL., U. S. A.
"IN BUSINESS SINCE 1904"

FAHNESTOCK ELECTRIC COMPANY, INC.

No. 30 Test Connector



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WESTERN RAILROAD SUPPLY COMPANY

2360 SOUTH ASHLAND AVENUE

CHICAGO 8, ILLINOIS

● Tired of complaints that bridge or test connections to your lines cause noise because screw threads loosen? Or that they are hard to put on and the right tool was missing? Then use our time tested No. 30 Connector. Requires no tools. Vibration, heat or cold, rain or snow will not affect them as they are made of real bronze. They snap over (not threaded) any wire not over No. 8 B&S.

Signal Corps Development

(Concluded from page 56)

is through reports sent to the laboratories by field units, or gathered by liaison personnel sent to the field from the laboratories. Second, and more important, are the laboratory teams operating within the theaters of operations, and the scientific officers attached to the staffs of combat units. Development has thus moved nearer the front, while research has moved back, entirely into the hands of civilian agencies.

Development must maintain its present status with respect to the Signal Corps up to the surrender of the last enemy. We shall never know when it enters the phase of declining usefulness shown on our hypothetical graphs. Attempts to forecast that phase are too dangerous even to contemplate. We must remember that Hitler thought he had entered the final phase of his war in 1940 and again in 1941. He entered the war with the idea that he could finish it with the same equipment with which he started. He learned better, and now has large numbers of highly efficient people thinking up unpleasant surprises for us. The enemy may spring those surprises up to the last minute, and up to the last minute we must be ready to counter them. Somehow we must find a way to continue to use our scientific manpower with undiminished effectiveness, for it is our one irreplaceable resource for which there is no substitute. We must maintain our research teams until the last shot is fired and after, for otherwise we may find that what we thought was the last phase was merely a breather before a new and more deadly resumption.

Therefore, even from the superior knowledge of hindsight, we should not assign negative values to research and development in any phase of the war, any more than business can regret after the fact that insurance premiums did not result in payment of claims not made. Moreover, while it is true that we have but a single mission, when the final phase does come, we shall have a new and equally important one—the prevention of the next war. I hope that we have now learned that preparedness is the best preventative. Our unused techniques will be a major contribution toward that end.

If we are wise, research and development of much of the present type will continue. If so, the present partnership between science and the military forces will not be dissolved, and neither will be completely demobilized. If that plan is followed, we may be able to postpone the "next war" indefinitely.

V V

Copper Wire and Cable Release Expected

Reduced war demands for copper wire and cable after Germany falls should permit mills to handle civilian orders at levels approaching prewar operations, the War Production Board reported September 20. WPB told the industry it plans elimination of all unnecessary government controls, reports and directions on cessation of European hostilities. Only those controls needed to insure fulfillment of military requirements for victory over Japan will be retained.

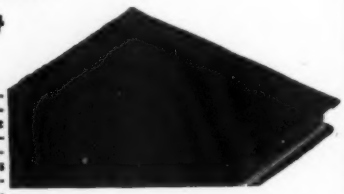
V V

Independent to Build Cafeteria

The Durham (N. C.) Telephone Co. recently obtained a building permit to construct a cafeteria and kitchen in its main exchange building.

What the COMMUNICATIONS WORKER NEEDS

to know about electricity



Radio men, telephone engineers, telegraphy technicians — all workers in the communication industry — here is a book written expressly for you. It gives you a clear, practical explanation of the fundamentals of electrical engineering *upon which communication is based*. All the explanations, all the illustrations, all the applications are taken from the communication industry and not from the power industry.

THE ELECTRICAL FUNDAMENTALS OF COMMUNICATION

By A. L. Albert, Professor, Communication Engineering, Oregon State College; Professor, Electrical Engineering, Purdue University (1942-43); 550 pages, 6x9, 359 illustrations, $3.50.

Presents the electrical fundamentals of communication, including the three divisions—telegraphy, telephony, and radio with its allied branches. Starts with electronics, explains what the communication technician wants to know about direct current, conductors, resistors, insulators, and discusses such topics as the magnetic field and inductance and the electric field and capacitance solely from the point of view of the communication industry.

COVERS SUCH TOPICS AS:

- Electric measuring instruments
- Electric networks
- Bridge circuits
- Transmission of electromagnetic waves
- Vacuum tubes as circuit elements
- Electroacoustics

TELEPHONY PUBLISHING CORP.

608 S. DEARBORN ST., CHICAGO, ILL.

Telo. No. Wab. 2435

DAY IN - DAY OUT

Here's a Ringing Converter that is absolutely dependable. It is built for heavy duty and designed to operate at highest efficiency for a long period of time. Once you've installed Sub-Cycle you have no bother of routine maintenance. There are no moving parts, nothing to adjust, no radio interference and it is quiet and economical in operation. It has proved a most satisfactory source of signaling service in thousands of installations.

ALSO PULSATORS

SOLD BY LEADING DISTRIBUTORS

THE LORAIN PRODUCTS CORPORATION

LORAIN, OHIO

G. I. Janes in the Signal Corps

(Concluded from page 34)

No doubt many others will win high honors before our final victory has been achieved. The rigors of war have not, however, transformed these women into Amazons for they continue to be strictly feminine.

WAC activities at Fort Des Moines, Iowa. JUANATA S. REDMAN, WAC private, at switchboard with CAPT. H. J. POMY, Signal Officer, at post.

After the day's work is done, they promptly lay aside the olive drab service uniforms and lounge in the frilly things which are so dear to the hearts of all women. Ask any WAC what her postwar plans are and almost invariably she will answer, "have a home and babies." No doubt they secretly look forward to the time when they can take a small grandchild on their lap and explain the interesting details of how its grandmother helped win the great war and a lasting peace.

Yes, these G.I. Janes, by their devotion to duty today, and their hopes for tomorrow, contribute much to the future of a greater America.

V V

Former Plant Foreman Home on Leave

LT. COL. E. O. CAIN, of the U. S. Signal Corps, former plant forman at the Danville (Ill.) office of the Illinois Bell Telephone Co., returned to his home in Champaign recently on leave.

He served in the South Pacific for 28 months and wears the South Pacific campaign bar with three stars for service in three major engagements.

A Mark of *Communication* Dependability!

ADC

AUDIO DEVELOPMENT COMPANY

MINNEAPOLIS 7, MINN.

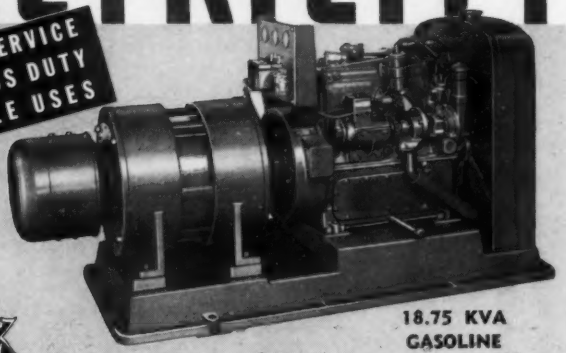
● Into the design and manufacture of ADC Transformers, Filters, Equalizers and related electronic equipment goes the determination of trying to do every job just a little better. We call it "compounding experience". This ambition to achieve perfection in all details is the momentum behind the ADC performance record. We are sincere in saying — "Let us help you when we can".

BUY WAR BONDS FOR VICTORY!

Catalog Available

ELECTRICITY

for STAND-BY SERVICE
CONTINUOUS DUTY
PORTABLE USES



18.75 KVA
GASOLINE

ARMY E NAVY

More and more telephone companies are installing stand-by electric plants to insure uninterrupted service. We are supplying many of these plants. Already there are well over 1000 U. S. stand-by units throughout the world at vital radio and communication centers. U. S. Electric Plants are now available on AA3 priority or better. Write for details.

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MOTORS CORP.
556 Nebraska St.
OSHKOSH, WIS.

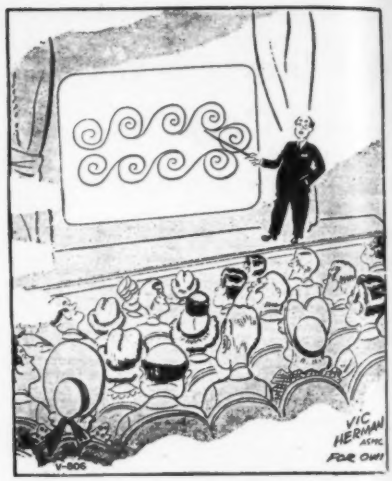
U.S. Electric Plants
GASOLINE • KEROSENE • DIESEL

LINEN LACING TWINE

Now and After
The War
You Will Surely
Want to Use
Armature
Brand
Manufactured
to Meet
Your Requirements

EDERER, INC.
PHILADELPHIA 24, PA.

H. S. Clark & Son, Chicago 6 — F. J. Fawcett Inc., Boston 11 — Hayne-Surridge Co., St. Louis 3 — H. H. Kemper Co., Cincinnati 2



(Courtesy, TELEPHONE TOPICS)

"This, ladies and gentlemen, isn't a Greek ornament. It's the diagram of a soldier hunting for a vacant telephone booth."

Hitler Faces the Music, Say Copyrighted Telephone Lyrics

The fact that Hitler is facing the music is evidenced in the following collection of telephone songs belonging to C. A. Swoyer, TELEPHONY'S Ohio correspondent. These songs were copyrighted in 1942 and 1943:

"Hitler 'Phones' for Help," "Hitler and the Devil on the Telephone," "Goodbye, Mr. Hitler, You Are Through," "Hitler, Aren't You Feeling Well?" "Hello Hitler, Want a Date with You," "Hello There, Hitler," "Hitler on the 'Phone'," "Hello Berlin, Here We Come," "Hello Central, Call Berlin."

Other songs in Mr. Swoyer's collection in which the telephone goes to war and with copyrights ranging from 1918 to 1942 are as follows:

"Hello Central, Give Me USA," "Hello America, Hello," "Hello Lady America—Howdy Uncle Sam," "Hello America! How Do You Do New York?" "Hello Broadway — London Calling," "Hello Central, Give Us Washington," "Call from Washington," "Hello Central, Give Me London."

V V

New Chief Operator

RUTH DUNN, Aledo, Ill., recently succeeded Mrs. Irene Frisk as chief operator at the Columbus Junction (Iowa) exchange of the Iowa-Illinois Telephone Co.

V V

Killed in Action

LIEUT. HARRY KOEPPEL, 29, son of Harry S. Koeppel, Nassau area district manager for the New York Telephone Co., was reported killed in action in France on July 29.

Better Take Chips In This Game

(Continued from page 18)

of such baffling problems as wartime and postwar taxes, postwar selling and directory compilations, toll compensation matters, and the annual election of officers.

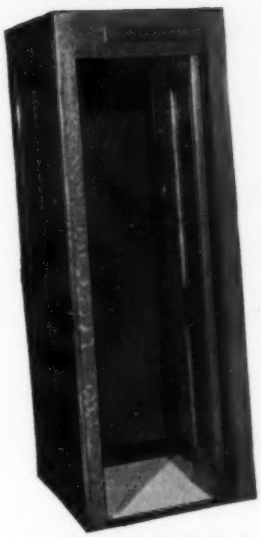
Another thing the small telephone company man might be tempted to say is this: "I'll admit there is some very good stuff on this program, but I also subscribe to a very good trade publication, TELEPHONY. Why can't I get most of the benefit by simply waiting for TELEPHONY to tell me about it a week later?" The editors of TELEPHONY honestly wish they could fulfill that function, but unfortunately the best they can do is to report what happened and publish addresses and reports as they have faithfully done in previous years and expect to do in the future.

The main fallacy of this argument, Mr. Small Telephone Company Man, is simply this: If you were not there, *you did not help it to happen.* A record of events in which other people participated, is by no means a substitute for the inspiration and mental stimulation that results from participating yourself. It is the difference between sitting in the grandstand and playing on the team. *Are you playing on the telephone industry team?* You can help your brother and your brother can help you only if you meet him face to face, discuss your differences, slug it out man to man, and come away with a few thoughts in your head that you did not have there before.

Granted you may get some of this secondhand by reading a report of what somebody else did a week later in your favorite trade publication. But you can see that it is not going to do you the same amount of good and it is not going to sink in as deeply as if you made a personal appearance. You can't talk back to a printed page. You can't influence the thought or contribute to the action of a session that is already history.

One thing about a business convention in America, and probably the most characteristic feature right now, is that they are democratic. Each and every member in attendance is invited and urged to participate, to bring his questions with him — preferably to write them out in advance. It is only in a free country such as ours that the little company men are even able,

STROMBERG-CARLSON
RECOMMENDS—



CHURCHILL
An ATTRACTIVE TELEPHONE BOOTH

Not only attractive—but comfortable and private—the **CHURCHILL** No. 100 Folding Door Telephone Booth will increase your pay station business.

Operating companies have found the **CHURCHILL** No. 100 Folding Door Telephone Booth a builder of pay station business.

It is constructed as a single unit and equipped with a reinforced back panel for mounting a wall telephone or coin collector.

The **CHURCHILL** Booth is made of selected white oak and is available in light or medium oak in a satin finish.

Included as standard equipment are electric light and automatic electric ventilator.

Overall height is 84¾"; width, 29"; depth, 30½". Shipped knocked down and crated.

Illustrated literature available.

"DEPENDABLE"

CROSS-ARMS
ARE MADE BY
American Cross-Arm, Inc.

The best quality cross-arms you can buy.

AVAILABLE IN:

- Douglas Fir
- Creosoted Yellow Pine
- Gulf-Red Cypress

These well-seasoned, sturdy cross-arms are . . .

Available for Prompt Shipment

STROMBERG PROGRESS IN TELEPHONY CARLSON

STROMBERG-CARLSON COMPANY
Factory and General Offices: Rochester 3, New York, U. S. A.
Branch Offices: Chicago, Kansas City, San Francisco, Toronto

★ An Invitation

Delegates to the U. S. Independent Telephone Convention are cordially invited to visit The Lakeside Press during their stay in Chicago.

During more than 40 years of telephone directory making, The Lakeside Press has developed an unusual organization for handling all of the details of this specialized branch of the printing business.

THE LAKESIDE PRESS

R. R. Donnelley & Sons Company

350 EAST TWENTY-SECOND STREET, CHICAGO, ILLINOIS

Airco Dry Nitrogen

SIMPLIFIES CABLE TESTING

A quarter century of experience with many important telephone systems has proved that Airco Dry Nitrogen is equally effective for testing new cable and for permanent gas pressure installations. Please order only as needed, and return empty cylinders.

OTHER AIRCO PRODUCTS

Oxygen, acetylene, hydrogen, carbon dioxide, argon, neon, and other rare gases.

Oxyacetylene welding and cutting apparatus and supplies.

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much less encouraged, to express themselves in this manner. *That is why your attendance at these meetings is not only a vote of confidence in your trade association and free enterprise as exemplified by your industry, but also it is an exemplification of the American way of life.*

Maybe you think that is putting it on too thick. Well listen to this: One telephone official recently told this writer about a so-called telephone industry association meeting held in Nazi-dominated Vienna in 1939 prior to the outbreak of World War II. It included representatives not only from the government-owned German telephone system but also from private company operators in Rumania and other Balkan countries. The program started with a Nazi hymn and from there on unreeled all the trappings and preordained ritual of a strictly totalitarian function.

Discussion? Free expression of ideas? Participation by the visiting membership? Nothing of the sort! Those men were not brought there to express themselves. They were brought there to be told what to do and expect. Any attempt to give a different point of view might have had some serious personal consequences to any such daring party. It would be a quick way to wind up in a concentration camp. It was at this meeting that private operators got their first hint of what to expect when the Nazis later invaded the Balkans and puppet governments seized private plants, throwing out private management.

What a contrast with the democratic business conventions which our American system of private enterprise has developed for its industrial community! Maybe a good plan of getting the best out of the conventions would be to look over the program item by item and say to yourself: "What are my most puzzling questions on these various topics?" Write them down on a slip and take them with you to the convention sessions. Don't be afraid to get up on the floor and get your money's worth. Everyone wants you to do just that.

Some time ago a certain telephone company man was heard to remark that he had read a very interesting technical article in a trade publication which contained some ideas which he thought "might be worth hundreds of dollars" to him except for one drawback. There were a few things he did not understand. And he was not sure that he could express himself if he tried to take the matter up with the author of the article by correspondence. A suggestion was made that he take his questions to the next meeting of

his state telephone convention at which the author of that article was scheduled to speak.

It turned out from the nature of the program that he was not able to ask his questions on the floor, or perhaps he was just a little self-conscious about it. But later on, the convention afforded him an informal opportunity of meeting the author of that technical article in one of the hotel rooms, and the difficulties disappeared very quickly under the light of a cordial conversational visit.

That telephone man himself admitted that he went back home with a more complete understanding of a constructive program, the details of which had been puzzling him for months. Whether it resulted in saving him hundreds of dollars upon practical application, this writer was never able to find out. But there are many, many such ideas floating around which could save you thousands and thousands of dollars, Mr. Small Telephone Company Man.

And that brings us to the greatest of the opportunities which a telephone convention affords. First of all, you can go into a panel discussion or conference and ask your questions for the benefit of the others. Second, if you are timid about this, you can buttonhole your man in a corridor and find out that way. You can discuss problems of equipment with manufacturers under ideally congenial conditions which you would not possibly obtain elsewhere. It is safe to say that there never has been a convention yet at which potential stakes of thousands upon thousands of dollars in the form of workable ideas and inspirations were not there for the taking by people who neglected to spend a few dollars and the few days necessary to put in a personal appearance.

This year, with the multiple problems of war and postwar operations worrying every man and woman in the telephone business, the stakes are higher than ever. You can't afford to overlook your chance, Mr. Telephone Man, big or small! You had better take some chips in this game!

V V

Field Telephone Aids Marine Mortar Fire on Saipan

S/Sgt. Dick Tenelly, Washington, D. C., a Marine Corps combat correspondent, formerly of the Washington *Daily News*, sent the following delayed dispatch from Saipan, Marianas Islands:

Whispered telephonic directions from Fourth Marine Division spotters inside the Japanese lines, at one stage of the fighting on Saipan, were credited with

Have You A Chassis Available?

OK! —Then "AMERICAN" Can Help You—

For NOW "American" Can Furnish A Limited Number of Utility Bodies of the Following Types:—

- Line Construction Bodies (Models DPL & DT).
- Service and Meter Bodies (Model 4460).
- Street Light Patrol Bodies (Model 4671).
- Telephone Rural Installation and Maintenance Bodies (Model 4551).
- Revolving Aerial Ladaers (Model 4644).
- General Utility Compartments (Model 4804).

Today, more than ever, you need equipment that will save time and labor and also materially decrease the physical strain on your men. American Utility Bodies do exactly this. So if you have a new chassis or a good used one, write, wire or phone for details and get complete information.

Some Reasons Why "Americans" Are TOPS:—
Correct Design • Superior Quality Construction • Comfort • Convenience • Safety • Endurance • Low Operating Cost • Fine Appearance

KEEP ON BUYING WAR BONDS

THE American COACH & BODY CO.
PUBLIC UTILITIES EQUIPMENT FOR MOTOR VEHICLES

HEMINGRAY INSULATORS

Favorably Known Since 1870

HEMINGRAY No. 16
Has square groove which provides substantial support for line wire.

STANDARD *of the Industry*

Hemingray Insulators have served the telephone and telegraph industry for more than seventy years.

And — in that time — they have proved their ability to give *dependable, long-life service.*

That's why leading telephone and telegraph companies have adopted Hemingrays as *standard equipment.*

Hemingrays are sold by principal jobbers and are manufactured by Owens-Illinois, Hemingray Division, Muncie, Ind.

OWENS-ILLINOIS

HEMINGRAY INSULATORS

Telephone-Telegraph

Export Agents: International Standard Electric Corporation, New York City

an estimated toll of 300 Japanese killed in two days.

Marine spotters were led one day by Marine Sgt. Raymond A. LeMay from South Carolina.

Accompanied by a small patrol, Sergeant LeMay and his two helpers scaled an enemy-held crag overlooking a beautiful valley in which a considerable number of Japanese troops had been pocketed. Hiding themselves for the day, they proceeded to direct Marine mortar fire on the enemy below them by means of a field telephone which they carried with them.

Their presence obviously was suspected by the Japanese occupying their ridge, as enemy gunfire frequently whizzed close to them. There was the constant danger of their telephone wire leading the enemy to their position.

At times the small party could hear the enemy moving and talking around them, but their main interest was in the larger number of Japanese troops below them. Whenever the Japanese presented a suitable target, a few words whispered into the telephone sent 81 mm. mortar shells into the enemy ranks.

The directions went to a mortar outfit led by Lieut. C. A. Landmesser.

An official estimate set the number of Japanese probably killed by Marine mortar fire at 300.

V V

Named Gift Division Chairman

VICTOR E. COOLEY, vice president of the New York Telephone Co., was named honorary chairman of the Men's Advance Gift Division of the New York War Fund, RICHARD W. LAWRENCE, general chairman of the war fund's appeal, announced September 13.

V V

Named Temporary Manager

FRED SCHWENT, who for 18 years has been associated with the Southeast Missouri Telephone Co., recently was named temporary manager of the Flat River (Mo.) exchange, according to information received from that office.

V V

Personnel Change

Effective September 18, ALFRED BRANDT succeeded AUGUST STEINHART as manager of the Wonewoc (Wis.) exchange of the Northwest Telephone Co. Mr. Steinhardt was transferred to the East Troy (Wis.) office in the same capacity.

V V

Peoria (Ill.) Manager Appointed

Appointment of BENJAMIN W. FORD, as manager of the Peoria area of the Illinois Bell Telephone Co. effective September 16, was announced September 8 by W. D. FORD, district manager. B. W. Ford succeeds JOHN L. TINCHER who moved to Detroit, Mich., to enter private business.

TELEPHONE REPAIR AND SUPPLY CO.

Specialists in transmitter repairs.

WE BUY
WE TRADE
WE REBUILD
TELEPHONES & PARTS

A post card will bring full information

We have for prompt shipment:

MOUTH-PIECES
RECEIVER SHELLS
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TELEPHONE REPAIR AND SUPPLY CO.

ROGERS PARK STATION
CHICAGO 26, ILL.

Asheville (N. C.) Mayor Appeals For Shorter Telephone Calls

Calling attention to recent increases in civilian and military population and in the number of telephone calls, Mayor L. Lyons Lee of Asheville, N. C., on September 16 appealed to the citizens of Asheville to limit their telephone conversations so additional calls could be completed.

"Recently many complaints have been received, occasioned by the inability of people to get telephone calls through, due to the continued use of the lines in question," Mayor Lee declared. "This situation seems to prevail where party lines are being used, and two or more people are compelled to use the same service. Also, over rural lines extending throughout the county where several parties must share the same line.

"This situation is one over which the telephone company can exercise no control, and it is only through the cooperation of its patrons that an improvement in service can be accomplished. I am asking that our people refrain from carrying on continued conversation for a period of over 10 minutes for local calls and for five minutes on calls to distant points," the Mayor said.

V V

Telephones Exceed Japan's

With nearly two million telephones, New York City has more than all of Japan, although Japan has 10 times as many inhabitants.

Best Story of the Week—What's Yours?

"Children should be seen or not heard," thought three-day-old Robert LaBuoy, Jr., East St. Louis, Ill., recently when Warrant Officer Robert LaBuoy, Sr., of the Sea Bees was calling from "somewhere outside the United States" to talk to his wife, Jane, and, if possible, to his new son.

The conversation with Bobbie's mother was easily arranged, but the seven-pound four-ounce boy presented problems that were all but impossible in the tense three minutes. Brought from the nursery, the little lad was sleepy, full of yawns and completely uninterested in the father whom he had not yet met. Nurses were unable to persuade Bobbie to talk by gentle methods so just before the three minutes ticked off, someone substituted a mild slap for a gentle "coo" and a healthy, convincing bellow greeted the proud father just before he hung up.

Communication between key executives quickly became the biggest production bottleneck of the Foster Engineering Company, Newark, N. J., when war sky-rocketed demands for their automatic valves for marine use.

"Speed is the essence of all our contracts. Teletalk Amplified Intercommunication with its never-failing performance has been an invaluable ally by supplementing the work of an overburdened switchboard . . . eliminating inter-plant phone calls . . . enabling our key men to get vital information at once," says Stephen Berrien, Foster personnel director.

Among your subscribers there are many busy offices and plants . . . both large and small . . . where time-saving Teletalk Amplified Intercommunication would conserve the time and energy of valuable men and women.

Teletalk can be a profitable source of new revenue for your telephone company. All that is necessary is to show these busy concerns how quickly and easily Teletalk speeds the gathering of information on orders, production, accounts, shipments . . . even allows a conference of executives with each at his own desk. Time saved in a few months will pay for Teletalk.

Teletalk is easy to install . . . operates from the light circuit. For complete information, get in touch with your nearest distributor or write to us.

WEBSTER ELECTRIC Teletalk

Licensed under U. S. Patents of Western Electric Company, Incorporated, and American Telephone and Telegraph Company

BUY EXTRA WAR BONDS

WEBSTER ELECTRIC CO., Racine, Wis., U. S. A. Est. 1909. • Export Dept.: 13 East 40th St., New York (16), N.Y. • Cable Address: "ARLAB" N.Y.C.

WEBSTER ELECTRIC

"Where Quality is a Responsibility and Fair Dealing an Obligation"

These Are Tools For War, Too!

All the tools of war aren't guns, shells, tanks, mortars or other weapons. Pliers, wire-cutters, splicing clamps, and many similar items play an important part. With the armed forces, and with those at home too, these tools are helping us win the biggest war in all history.

Because they are important to the war effort, your tools deserve good treatment. Klein Tools, especially, are so sturdy and dependable they'll last well beyond any duration if you'll give them reasonable care. But, when you do need new tools, specify Klein, and we'll do our best to meet your needs promptly.

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P&H PENTA POLES

FULL-LENGTH TREATED NORTHERN WHITE CEDAR

TWELVE REASONS WHY

LEADING TELEPHONE COMPANIES STANDARDIZE ON PENTA POLES

No. 11. P&H Penta treatment is non-conductive and non-corrosive.

Watch for Reason No. 12

PAGE AND HILL CO.

MINNEAPOLIS, MINNESOTA • 50 CHURCH STREET, NEW YORK, N. Y.

"STILL IN THE LEAD"

Distributed by AUTOMATIC ELECTRIC SALES CORPORATION STROMBERG-CARLSON COMPANY

(Courtesy, NORTHWESTERN BELL)

"What! Only five minutes to tell him 'yes'?"

Marines Salvage Radio Sets To Use in Tinian Battle

His radio sets soaked in sea water, riddled by enemy bullets and blasted by enemy mines, Marine S/Sgt. James G. Searcy, communications chief of the first Marine landing team on Tinian, Marianas Islands, salvaged what he could and had essential combat communications functioning efficiently about an hour after landing, according to a delayed report by S/Sgt. Dick Tennelly, a Marine Corps combat correspondent.

The landing team's communications officer was killed when the men landed, neck-deep in a pounding surf among jutting, jagged coral rocks, with Japanese machine guns, rifle fire and hand grenades trying desperately to keep them from landing.

Sergeant Searcy, 23, West Asheville, N. C., and his communicators stumbled ashore. The radio on one man's back was punctured by a bullet. The radio probably saved his life, but the set was ruined.

Another radioman stepped on a land mine. His set was promptly removed from his body by a buddy, Marine Pfc. William J. Miller, Jr., East Orange, N. J., who carried on with it.

Inland a short distance, temporarily free from enemy fire, the outfit paused to reorganize its depleted ranks. Staff Sergeant Searcy found that such radios as had not been damaged by enemy fire had been soaked by immersion in sea water on landing.

The sets were quickly stripped and laid in the pale sun to dry. Then undamaged parts were pieced together until sufficient radios were in working order to fulfill the needs of the battle ahead.

Jewett Fellowship Fund Established by AT&T

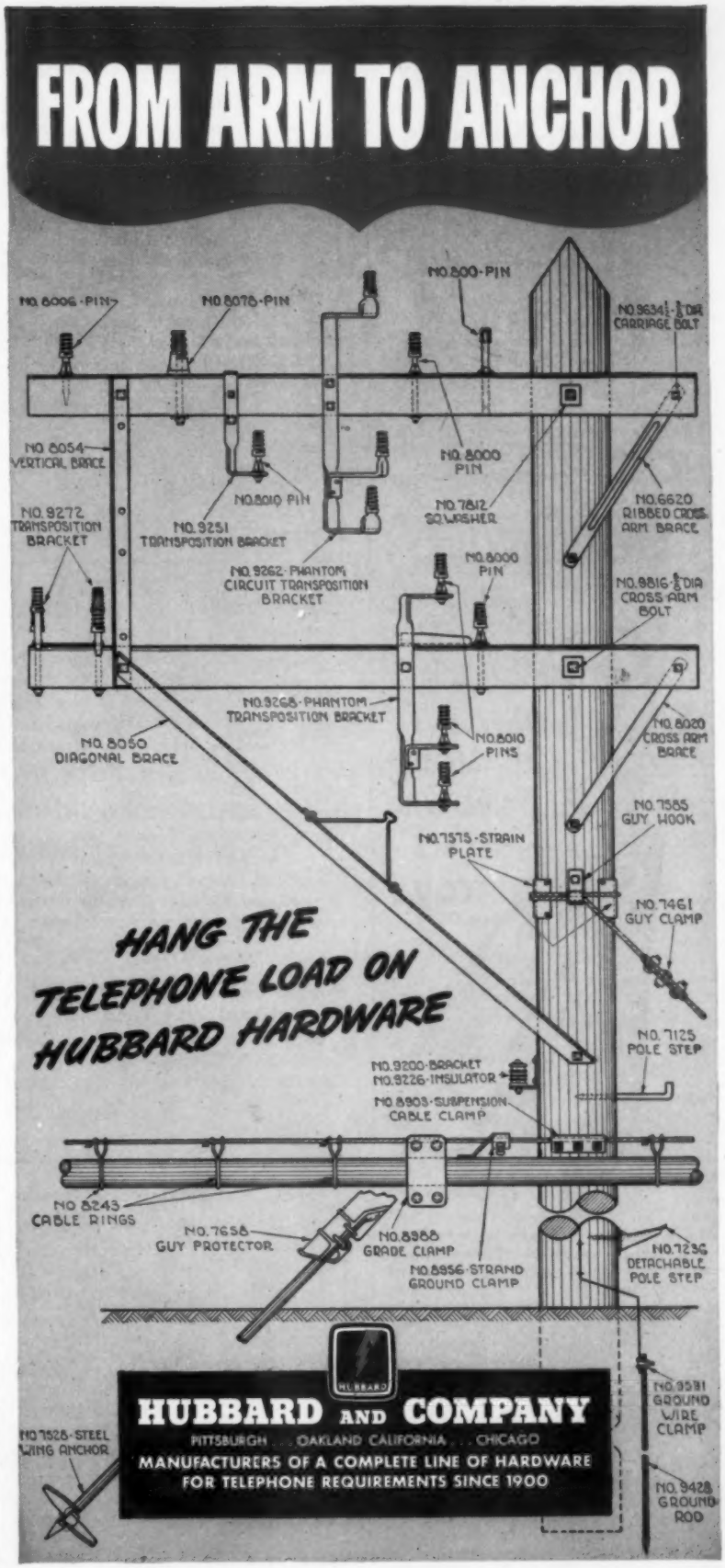
Walter C. Gifford, president of the American Telephone & Telegraph Co., announced September 22 that the company has established a trust fund to finance post-doctorate fellowships in physical science in honor of Dr. Frank B. Jewett, president of the National Academy of Sciences, and vice president of AT&T in charge of development and research, who retires from active telephone service at the end of September, having reached the company's retirement age.

DR. FRANK B. JEWETT

There will be five fellowships awarded annually, according to Mr. Gifford's announcement. The purpose, he said, is to stimulate and assist research in the fundamental physical sciences, and particularly to provide the holders with opportunities for individual growth and development as creative scientists. The fellowships provide an annual honorarium of $3,000 to the holder and $1,500 to the institution at which the recipient elects to do research.

The Frank B. Jewett Fellowships will enable their recipients to devote themselves to research in pure science for a year or two following their doctorates. Since a purpose of the fellowships is to provide for the full time continuation of academic research, awards normally will be made to those who have obtained the doctorate within the preceding year, or are expected to receive that degree not later than the beginning of the next fellowship term which starts each July 1.

The fellowships will be awarded on recommendation of the Frank B. Jewett Fellowship Committee. This committee will consist of seven members of the scientific staff of Bell Telephone Laboratories who are actively and creatively engaged in research in the respective



"Hours Saved on the Job and I'm not Tired!"

That's the experience of war workers everywhere when they use these Bernard Nippers.

BERNARD
TRADE MARK REG.

No.177—5½"
Diagonal Side-cutting
NIPPERS
They give
MORE
POWER
TO
YOU!

Super-powerful leverage, keen hardened jaws cupped for greater clearance. Self-opening spring handles. The perfect aid to fast production.

Send for catalog of the Schollhorn line of BERNARD tools.

THE WM. SCHOLLHORN CO.
TELEPHONE TOOL DIVISION
420 Chapel St. New Haven, Conn.
Exclusive Makers of BERNARD Parallel Action Tools

Do You Know?

A—If you overheard a long distance operator say "NC" you would say

1. No operator, Quiggsville is not in North Carolina.
2. Will you call me back when you can get a line?
3. Of course I'm nice!

B—A jack is

1. Something to plug into
2. A toy for little girls
3. What takes a ten-spot
4. Tire-changing tool
5. At the end of a switchboard cord

C—A decibel is a

1. Girl's name
2. Musical instrument
3. Spring flower
4. Lineman's whistle
5. Unit in acoustics

D—A crystal is

1. Used by war-forecasters and stock tipsters
2. Tableware for company only
3. What breaks first on your watch
4. Frequency-control device
5. Switchboard lamp cap

E—Crossbar is a term meaning

1. Menace to navigation
2. Dial system
3. Part of a distributing frame
4. Wrestling hold
5. Cattle brand

Answers on page 92

fields of physics, mathematics and chemistry.

In the selection for fellowship awards, the primary criteria will be demonstrated research ability of the applicant, the fundamental importance of the problem he proposes to attack and the likelihood of his growth as a scientist.

Selection for a fellowship award and its acceptance shall involve no implication or commitment on the part of Bell Telephone Laboratories or on the part of the recipient as to later employment in the laboratories.

V V

Pacific T&T Donates $135,000 To National War Fund

N. R. Powley, president of Pacific Telephone & Telegraph Co., San Francisco, announced September 12 that directors of that company and its subsidaries had voted a contribution of $135,000 to the National War Fund.

Eighty five thousand dollars will be allocated in accordance with war fund quotas in the territories served by the companies, and $50,000 will be given to the Community Chest.

V V

New England Company Elects Officer for New Post

Election of William W. Wrenn as vice president in charge of public relations for the Southern New England Telephone Co., New Haven, Conn., was announced on September 14. This is a newly-created post.

Laurence E. Stone succeeds Mr. Wrenn as general commercial manager of the company, both promotions resulting from a meeting of the company's board of directors.

Answers to Traffic Questions on Page 48

(1) Ordinarily, the "T" is not necessary since the toll center's ticket is used for billing. However, this depends upon the local accounting ruling.

(2) The answer to this question is in the preface.

(3) This action is not necessary unless the call becomes subject to a special collect rate.

(4) In general, any call handled over a connection built up through more than one office by means of ringdown toll circuits and ringdown trunks, or ringdown toll circuits alone, is considered a multi-switch call.

(5) A report of "no one to accept the charge" is considered equivalent to one on which the called station refuses to accept the charge. If the calling party does not agree to pay for the call and cancels it, and the call is one on which a report charge applies, it will be subject to the report charge.

Robot Bombing Adds New Danger To Telephone Operating

With "doodle bugs" flying over London at all times of the day and night, the job of telephone operator is not an easy one, since it demands the undivided attention of the operator, a difficult job when one ear—and sometimes both—are listening for sounds of the robot bombs rather than to the switchboard.

At the same time, when an increasing volume of long distance calls demands the attention of operators, the problem of operating to normal efficiency is especially difficult. This increase has followed the evacuation of women and children from London, the restriction on railroad travel and a host of similar circumstances, and despite the "telephone-less" campaign, which shows no signs of abating.

Into this situation have stepped girls from all over Britain, fully aware of the danger which awaits them, but anxious to do something to help their London colleagues. Manchester operators were perhaps the first to volunteer for exchange duties with London girls, offering the latter a fortnight in the comparative peace and calm of Manchester, while they stepped into the robot bomb area. Following this there has been a continuous flow of similar offers: Telephone girls in Glasgow, Edinburgh, Dundee, Aberdeen, and Inverness in Scotland and from all major English cities are ready to exchange places with the London girls, either as substitutes to allow the Londoners a respite, or as additional workers to meet any extra calls involved in the present emergency.

Before being accepted as volunteers, all the incoming girls were warned that they would be expected to work in imminent danger. "It was emphasized," said a telephone executive, "that volunteers would be expected to carry on during times of imminent danger, but this has sharpened their desire to be in the front line."

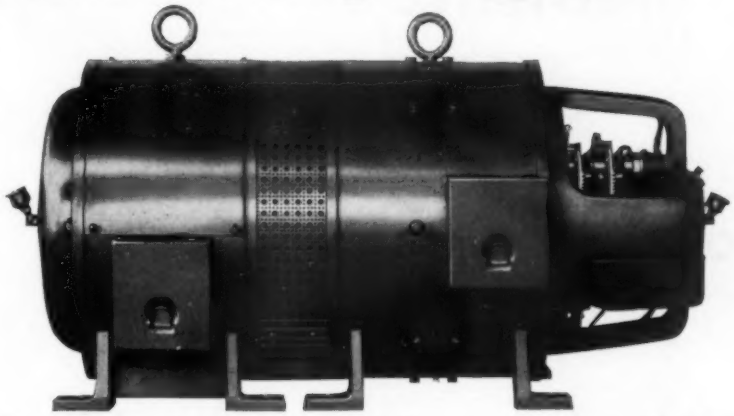
The telephone system of Great Britain has stood up to the deteriorated conditions very successfully to date, and there has not been any decrease in service. It is to allow the smooth functioning of the human element, as well as of the material involved, that the system of volunteer reliefs has been organized.

V V

Chief Operator Resigns

MRS. EDWIN KOTTKE, for many years chief operator at the Gilman office of the Illinois Bell Telephone Co., resigned September 1. She is succeeded by Sadie Wilson of the Watseka office.

THE DIVERTER POLE MOTOR-GENERATOR Meeting Completely Every Requirement for Charging Telephone Exchange Batteries . . .



Maintains Exchange Voltage within desired limits and insures Automatically Controlled Floating Charge of Batteries—Day and Night

Specially designed, carefully constructed, adjusted within precision limits and thoroughly tested in laboratory and field the Diverter Pole Generator has the characteristics required to assure peak performance at all times in charging Telephone Exchange Batteries. Some of these inherent characteristics are:

- Completely Automatic, it eliminates all manual attention to charging.
- It insures a continuous floating constant charging voltage controlled within very close limits under all loads.
- By shifting all loads, beyond the safe capacity of the generator, to the battery it protects itself against any dangerous overloads.
- It is free from any characteristics of "running away" or reversal of polarity.
- It is electrically and mechanically quiet in operation reducing to a minimum frequencies and harmonies which might be objectionable on the lines.
- It is economical in operation and maintenance.

DIVERTER POLE CONSTRUCTION

Proof of the dependability of the Diverter Pole Generator lies in the records of trouble-free highly efficient performance in hundreds of installations over a period of twenty years. For a safe, satisfactory, economical and trouble free charger of Telephone Exchange Batteries you'll find The Diverter Pole Generator unexcelled. It will pay you to investigate.

Write today for Bulletin No. 96.

The Electric Products Co.
1727 CLARKSTONE ROAD · CLEVELAND 12, OHIO

BE ON ALERT FOR GREMLINS

Number Transposer
The guy who rings the customer in the ear
The guy who messes up your count on a pre pay call
Busy Circuits
The lazy guy who makes the clearance rings too short to reach their destination
The guy who makes the customer mad
The guy who completely messes up MX calls thru uncleared circuits
Unseen Disconnects
The guy who makes crooked stamps

The wee people called gremlins have found they can have a merry time in a telephone office and never seem to tire of trying to break down the high quality of telephone service and efficiency. The above illustration, reprinted from "The Ohio Bell," shows a wide variety of gremlins. One gremlin has a speciality for number transposing, and his twin prods the subscriber into impatience. Another bad guy rings the subscriber in the ear. The coin "mixer-uper" lurks in the pay-station booth, while on the switchboard front is the lazy fellow who clears circuits with too-short rings and in turn confuses multi-switch connections through uncleared circuits. One pesky little whosit specializes in unseen disconnects. A very familiar gremlin is the one with the Calculagraph face and toll ticket body—he makes crooked stamps. But playing havoc with telephone service isn't all the gremlins are capable of for they are versatile fellows: They encourage you to be careless in personal habits causing accidents and illness, and the enforced absence from duty resulting therefrom. They encourage inferior performance. They whisper in your ear to ignore rubbers and an umbrella when it is raining, to cool off in ventilating drafts when you're warm, and to otherwise dare illness to attack you. In other words, gremlins are nasty creatures that delight in the failings of people —and machinery. They're plain saboteurs of the war effort!

Charlotteville (Va.) Investigates Expiring Telephone Franchise

A special committee was appointed by the Charlotteville (Va.) City Council on September 18 to investigate the present franchise held by the Virginia Telephone & Telegraph Co., with headquarters at Sioux Falls, S. D., scheduled to expire next April, and to consider provisions which the city might desire to include in a new contract with the firm.

A review of the existing franchise showed that it was negotiated by Charlottesville with J. Edwin Wood, representing the Albemarle Telephone Co. on April 1, 1895, and was scheduled to expire in 50 years.

BUY WAR BONDS

The U. S. Signal Corps Functions in England

Brief, factual reports of Signal Corps performance in England before, during and after D-day can be pieced together to form an impressive picture of the technical know-how and devotion to duty which have made our military communications system one of the wonders of this war. In all war theaters our men show the same qualities and abilities, but nowhere else have advance preparations been on so large a scale or formed so intricate a pattern as in England.

"Somewhere in England" this pattern began to take shape many months ago. Trained U. S. Army Signal Corps soldiers were sent to one of the great marshalling areas to set up an intricate network of communications which would weave into one web the various camps in the area. The British Government Post Office, which controls communications in England, put all its facilities at the disposal of the American crews, but the setup was found to be extremely meager for wartime operations. It was, in fact, no more than sufficient to take care of civilian needs.

The Americans, working in night and day shifts against a deadline, laid thousands of miles of wire, interconnecting all the camps. Skilled technicians assembled the loose ends at convenient points into temporary switchboards which were later replaced by permanent installations. Before the Normandy D-day, and during and after it, this elaborate but hastily built network functioned perfectly. It was a major factor in the smooth embarkation of our combat troops for transchannel beaches.

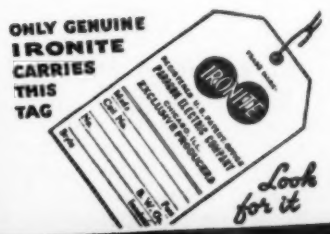
An American Service Forces Signal Depot, so fully mobile that it could be easily moved from place to place and even across the channel when troop advances in France warranted such a move, was established in England. At first it was set up to service units on pre-invasion tactical problems, but as D-day approached, its function changed rapidly. One of its main occupations came to be the servicing of radio receivers and transmitters for combat troops. The soldier-technicians worked in carefully camouflaged open-air shops along the roadsides, checking radio equipment so that it would be sure to operate at maximum efficiency. They waterproofed all radios used in tanks and military vehicles so they would function even though fully immersed. In many cases the instruments actually did function as well as ever, though drenched with salt spray or even "dunked" in the sea.

The Signal Center in England, where messages were cleared, noted, sent out

STROMBERG-CARLSON
RECOMMENDS—

GENUINE
IRONITE
DROP
WIRE

A recognized leader for forty years, because of its strength — long life — conductivity and easy workability.



"Eveready"
"Columbia"
"Gray Label"

The quality cell preferred by telephone engineers

Long Life Telephone DRY CELLS

- Higher sustained voltage.
- Longer life.
- Rock-bottom economy.

These qualities, more important now than ever before, are assured through the constant supervision of America's largest dry battery laboratory.

Made by the makers of "Eveready" "Air Cell" Operators' Transmitter Batteries.

STROMBERG-CARLSON COMPANY
Factory and General Offices: Rochester 3, New York, U. S. A.
Branch Offices: Chicago, Kansas City, San Francisco, Toronto

Reduce
Line Clearing
Costs
with
Seymour
Smith
TELEPHONE PRUNERS
This powerful pruner cuts closer, is stronger than any other similar tool on the market. Can be operated in close tangled growth; cutting easily and cleanly branches up to 1½" in diameter. No trouble with spring breakage.
Here is the only pruner with the famous Seymour Smith "Center Cut" construction; safety catch to lock blade closed; one piece tempered tool steel blade; reinforced hook; extra long life spring; ball bearing pulley; highest quality chain; unbreakable iron head.
Designed by experts for experts; demanded by public utility companies everywhere, it will pay you to write for literature and prices.
SEYMOUR SMITH & SON, Inc.
609 Main Street
OAKVILLE, CONNECTICUT

and delivered, was the heart of the whole communication system. This unit handled all sorts of messages, both incoming and outgoing, by teletype, telegraph, radio and courier. The words ran into the millions and were so accurately received and transmitted that it was possible for headquarters to coordinate every move of the invasion campaign and plan detailed operations on a split-second basis. Security was maintained by a staff of expert code men whose loyalty and trustworthiness were established by thorough FBI investigations. Supply problems were met, artillery firepower controlled and large troop movements of great intricacy directed through this smoothly-operating center "somewhere in England." It was very literally "in England," since it was 100 ft. underground in a quiet country-side.

V V

New Manager Named

MRS. REBECCAH BALL recently became manager of the Stapleton (Neb.) office of the Public Telephone Co., Arnold. She, assisted by MRS. LUTHER DILL, succeeded MR. and MRS. F. ALLEN, who had operated the exchange for the past 14 years.

V V

Buys Second Independent

Paul Raitor of Waverly, Minn., owner of the Dakota State Telephone Co., recently purchased the Midwest Telephone Co., Hurley, S. D., from William L. Ramlet of Hurley.

V V

Telephone Fund Made Official

Mitchel Field, L. I., recently announced that the voluntary fund, originated to pay for telephone calls home by newly-arrived wounded soldiers, has been given War Department sanction and the official name of "The Overseas Patients' Telephone Fund." (TELEPHONY, September 16, page 27.)

V V

Two Executives Appointed

DAVID B. PECKHAM, comptroller of sales of the Western Electric Co., New York City, has been appointed comptroller of manufacture, according to a company announcement of September 20. He succeeds JOHN M. STAHR, deceased. CLIFFORD W. SMITH succeeds Mr. Peckham as comptroller of sales.

Answers to Quiz on Page 88
A—2; B—1; C—5; D—4; E—2

REVERSIBLE SAFETY POINT
WIRE LIFT
CHANCE PIKE POLES have the extra features...
When you buy a Chance Pike Pole, you get a pole with a reversible point that can be inserted into the ferrule point first when not in use leaving no sharp projection. Worn points can be replaced. A wire lift attachment may be inserted in the same ferrule. Chance Pike Poles are lacquer finished and are reenforced at the butt by a metal ferrule which prevents splintering.
LACQUERED POLE
REINFORCED BUTT
A·B·CHANCE CO. CENTRALIA MISSOURI

Test-O-Lite
TESTS ANY VOLTAGE...
100 to 550 Volts, A.C. or D.C.
—Safely, Swiftly, Surely
THE NEON GLOW
LOCATES TROUBLE INSTANTLY
in electric circuits, fuses, cut-outs, motors, radios, appliances, etc.
FUSES
MOTORS
OUTLETS
PUTS "FINGER" ON THE TROUBLE SPOT
Indicates hot or grounded wire. Tells AC from DC. Far superior to ordinary clumsy test bulb. Indispensable in shop or home. Has PATENTED safety features. Vest pocket size with clip. Life time guarantee. List $1.50 (Priority A7 required). Purchase through electrical dealers.
L. S. BRACH Mfg. Corp.
55-63 Dickerson St Newark, N J

EVERSTICK ANCHORS...
FOR SPEED IN INSTALLATION
The exclusive Everstick nut housing locks the Anchor firmly on the rod. This speeds up installation. Plates are so designed, that they expand easily into undisturbed earth, and extra holding power is achieved. Made of tough, rust-resistant malleable iron. Write for bulletin.
EVERSTICK ANCHOR CO.
FAIRFIELD, IOWA

Stromberg Names D. S. Cook Sales Promotion Manager

Lloyd L. Spencer, vice president and general sales manager of the Stromberg-Carlson Co., Rochester, N. Y., on September 15 announced the appointment of David S. Cook, Rochester, as sales promotion manager for the company. In his new capacity with the 50-year-old communications firm, Mr. Cook will work directly under Stanley H. Manson, manager of public relations, advertising and sales promotion.

DAVID S. COOK

Mr. Cook will take charge of the company's expanding program in the field of sales training and, in addition, will direct the company's several publication activities.

Mr. Cook goes to the sales promotion post with an extensive background of sales and related experience. A native of South Byron, N. Y., he attended Batavia (N. Y.) High School, Genesee Wesleyan Seminary and Cornell University, graduating in 1924. After two years as an instructor in journalism and public speaking at Cornell, he became associate manager of Collins Management, Rochester concert and lecture bureau, serving as sales manager during the period 1935-42. Until last year, he was a vice president of the International Platform Association.

During his two years with Stromberg-Carlson, Mr. Cook was editor of the *Speaker*, one of the Rochester area's employe publications.

V V

Ex-Soldier Named Manager

JACK DWYER, who was discharged recently after two years' service in the Army, was named manager of the Cedar County Farmers Telephone Co., Hartington, Neb., succeeding OTTO ENERSON, resigned. (TELEPHONY, August 19, page 30.)

with THE MAN ON THE POLE

In these days, when work to be done exceeds available man-hours to do it, the right tools and supplies can stretch limited man-power by making jobs go smoother — and faster. GRAYBAR's years of experience can help you provide the man on the pole with the best available items for maintenance or essential war construction.

GRAYBAR Telephone Specialists know the products that go together in service and the tools it takes to install them. Our close relationship with leading suppliers permits fast action.

One of the more than 80 GRAYBAR warehouses is near you, ready to make fast delivery on many standard items. A GRAYBAR Man there will make your pole-line needs his personal responsibility. 5510

BATTERIES DROP WIRE POLES AND CROSSARMS CABLE LINEMEN'S TOOLS

INSULATORS STEEL WIRE HARDWARE

Graybar — 75 YEARS OF Electrical Distribution

IN OVER 80 PRINCIPAL CITIES

Executive Offices: GRAYBAR BUILDING, NEW YORK 17, N. Y.

Telephone Calls and Service Increase in Washington, D. C.

The number of Washington (D. C.) telephones in service increased from 364,780 in August 1943, to 364,935 on August 31, 1944, a gain of 155 telephones, according to the Chesapeake & Potomac Telephone Co.

The number of calls per day increased during the same period from 1,401,368 to 1,414,665.

V V

Named Fund Leader

H. F. McCULLA, general commercial superintendent of the Lincoln (Neb.) Telephone & Telegraph Co., recently was named head of the National Corporations Division of the Lincoln (Neb.) Community Chest for its 1944 campaign.

V V

Most Listed Surnames

The New York *Sun* reports that the six most listed surnames in the Manhattan telephone directory are Cohen, Smith, Miller, Brown, Levy and Swartz, in that order.

dependable
Cedar Poles
MICHIGAN POLE & TIE CO.
NEWBERRY—GRAND RAPIDS
MICHIGAN

Cedar Poles
MAC GILLIS & GIBBS COMPANY
Wells Bldg., Milwaukee 2, Wis.
★ ★
Northern White and Western Red
Cedar Poles—Plain or Butt-Treated

POLES

B. J. Carney & Co., 100 N. 7th St., Minneapolis, Minn.—Western red cedar poles. Pentrex Butt Treated or Plain.

C. M. Christiansen Co., Phelps, Wis.—Northern White Cedar Poles, plain or butt treated. Quotations on request.

International Creosoting and Construction Co., Galveston, Texas.—Creosoted Southern Yellow Pine Poles. Plants: Beaumont and Texarkana, Texas.

T. M. Partridge Lumber Co., Minneapolis, Minn.—Northern White—Western Red Cedar Poles. Plain or butt-treated.

Pensacola Creosoting Company, Pensacola, Fla. — Creosoted Southern Pine Poles of Superior Long Leaf Quality.

Valentine Clark Corporation, 2516 Doswell Ave., St. Paul, Minn.—Finished Cedar Poles. Plain or butt-treated.

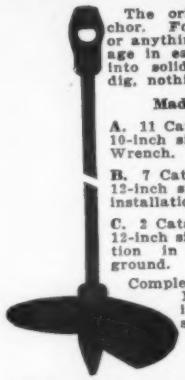
Are MANPOWER Troubles Cutting Your Directory Adv. Sales?

★ We have the MANPOWER, the EXPERIENCED ORGANIZATION to take over your Telephone Directory Advertising, handle all details and produce MORE NET revenue (all costs considered).

Write or call at our expense.

LOOMIS ADVERTISING CO.
408 OLIVE STREET, ST. LOUIS, MO.
New York Life Building, 20 W. Ninth St., Kansas City, Missouri
Citizens Trust Bldg., Fort Wayne, Ind.
135 So. Second Street, Philadelphia, Pa.

MATTHEWS SCRULIX ANCHORS



The original Screw Type Anchor. For anchoring pole lines or anything that requires anchorage in earth. They are screwed into solid ground. No holes to dig, nothing to assemble.

Made in Three Styles:

A. 11 Catalog Numbers, 4-inch to 10-inch sizes for installation with Wrench.

B. 7 Catalog Numbers, 4-inch to 12-inch sizes with heavy rods for installation without Wrench.

C. 2 Catalog Numbers, 10-inch to 12-inch sizes for pipe rod installation in swamps and marshy ground.

Complete information about Matthews Scrulix Anchors in an interesting bulletin supplied on request.

W. N. MATTHEWS CORPORATION
St. Louis, Mo.

ATLANTIC
Creosoting Co., Inc., 17 Battery Pl., N. Y. C.
Creosoted Pine Poles
Crossarms . . Conduit
PLANTS AND OFFICES:
New Orleans, La. Jackson, Tenn. Boston, Mass.
Winnfield, La. Louisville, Miss. New York, N. Y.
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ENGINEERS
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HERDRICH, BOGGS and CO.
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E. B. MATHEWSON COMPANY
Original Cost Studies • Continuing Property Record • Plant Records and Maps • General Engineering
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Appraisals—Financial
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1810 Lincoln Bank Tower Fort Wayne, Ind.

J. G. WRAY & CO.
TELEPHONE ENGINEERS
Specialists in Appraisals, Rate Surveys, Financial Investigations, Organization, and Operation of Telephone Companies
3324 Bankers Bldg., Chicago

CHANGE FROM THIS TO THIS
Flexibal
THE *Modern* GUARD
THAT DOES THE JOB BETTER AT LOWER COST
5-6-7-8 ft lengths available for IMMEDIATE SHIPMENT
Write for details and prices
S. E. OVERTON COMPANY
SOUTH HAVEN, MICHIGAN

Classified Section

Rates 10 cents per word payable in advance.
Minimum charge $2.00 for 20 words or less.

HELP WANTED

WANTED: Telephone Accountant—qualified to supervise all phases of telephone accounting for Class A companies. Give full information as to age, experience, draft status, etc. Attach small photograph. Write Telephone Services, Inc., 16th Floor, Lincoln Tower, Fort Wayne, Indiana.

WANTED: Experienced Wire Chief or Plant Supervisor, capable of supervising plant and equipment activities of a company operating over 5,500 telephones with three exchanges. Must be familiar with automatic equipment. Permanent position for one who can qualify. Give full information as to age, draft status, experience, education, etc. Write Box No. 2104, c/o TELEPHONY.

WANTED: CABLE SPLICER. To locate in Pennsylvania with company operating approximately 8,000 stations. Permanent position with satisfactory wages for qualified man. Give complete information in first reply, stating previous experience, draft status, etc. If presently working with an essential industry, statement of availibility will be necessary. Write Box No. 2105, c/o TELEPHONY.

WANTED: Experienced telephone engineer capable of making inventories, appraisals; must be qualified on equipment and outside plant engineering. Liberal compensation dependent on qualifications. In answering state qualifications, age, present connections, draft status and send small photograph. War Manpower Commission rules of employment observed. Write Telephone Services, Inc., 16th Floor, Lincoln Tower, Ft. Wayne 2, Indiana.

HELP WANTED

• DIRECTORY PRINTING

Commercial printing; complete book printing and binding.

E. W. STEPHENS CO., Columbia, Mo.

Reconstructed Equipment

Stromberg Carlson No. 951 C. B. Straight line oak wall Telephones with Ind. Coil Ckt. @	$5.00
Kellogg No. 115 Grabaphones with 3 Cond. Cord @	5.00
Kellogg, W. E. Monarch, Leich or Auto Rec. Shells and Caps @	.45
Kellogg, W. E. Stromberg, Monarch or Auto Elec. Mouthpieces @	.08
Swbd. Cord weights @	.20
Kellogg No. 801S. A. Common Battery Steel hotel sets with enclosed gong ringers, booster coil & Cond. @	9.50
Used W. E. No. 47 Swbd. Plugs @	.40
Western Elec. No. 22 C Shutter type drops and jacks 5 per strip @	10.50
Western Elec. No. 2C Ball type drops and jack 5 per strip @	8.25
Stromberg No. 14 A-CB Ind. Coils @	.45
Auto Elec. No. 612 Wood Hotel set with Straight line ringer, Booster Coil & Cond. Wired for Dial @	8.25

REBUILT ELECTRIC EQUIPMENT CO.
1704 WEST 21st PLACE
CHICAGO 8, ILL.

JUST REMOVED FROM SERVICE

W. E. Co. No. 1 TYPE SWITCH-BOARD

MULTIPLES
KEY SHELVES
AND
RELAY GATES
REMOVED FROM
CABINET INTACT

SEE US AT THE
U. S. I. T. A.
CONVENTION

BUCKEYE TELEPHONE and SUPPLY COMPANY
COLUMBUS (16), OHIO

Kellogg Appoints C. E. Brown New Supply Sales Manager

F. M. Parson, sales manager of Kellogg Switchboard & Supply Co., recently announced the appointment of C. E. Brown as manager of the supply sales department, the appointment being effective September 25.

Mr. Brown is well qualified in his position, as he has been associated with the Kellogg company in various capacities for over 25 years. He served overseas in World War I as a member of the Tank Corps in the U. S. Army and upon his discharge, joined the Kellogg organization, serving in the order department of the Kansas City office, then headed by H. M. Faris.

In 1928, Mr. Brown was transferred to Columbus, Ohio, as office manager of the Kellogg branch. In 1929 he was appointed acting district manager of the Kellogg branch at San Francisco, replacing H. A. Arth, who had taken a temporary leave of absence. Upon the return of Mr. Arth to duty, Mr. Brown was transferred back to Columbus, appointed field representative, traveling the eastern half of Ohio. This territory was later extended to include western Pennsylvania, the western part of West Virginia, and a part of New York state.

In 1927, Mr. Brown was made district manager for all of Ohio, West Virginia and western New York state, which position he held until his appointment as manager of the supply sales department.

V V

Dexterity; Women vs. Men

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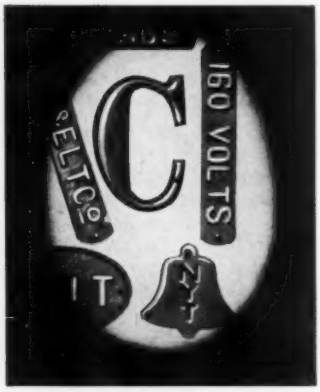

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